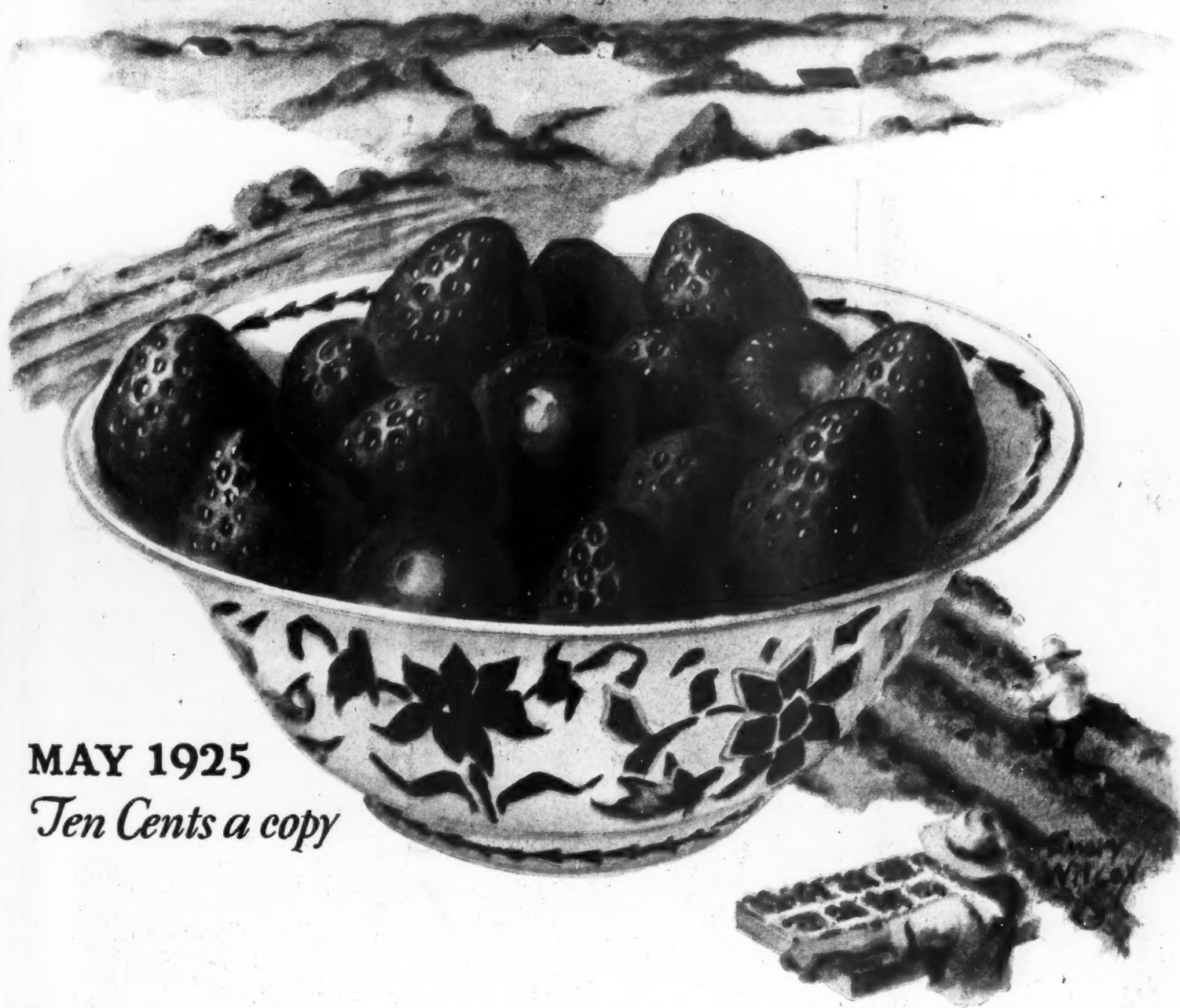


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The National Fruit Magazine of America

AMERICAN  
FRUIT GROWER  
MAGAZINE

Published monthly at 53 West Jackson Blvd., Chicago, Ill.

(Title Registered in United States Patent Office)  
Member of the Audit Bureau of Circulations  
Entered as second-class matter Oct. 17, 1917, at Post Office at Chicago, Ill., under the Act of March 3, 1879

HARRY W. WALKER, General Manager

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St. Louis, Mo.  
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Advertising Rates: \$2.00 an Agate Line Flat, or \$23.00 per inch. Classified, 15c a Word.

Subscription: 1 year, 50c; 3 years, \$1; Foreign: 1 year, \$1

Vol. XLV.

MAY, 1925.

No. 5.

# The Louisiana Strawberry Industry

By A. W. Roe

THE COMMERCIAL growing of strawberries in Louisiana was started more than 35 years ago. From a small beginning at Hammond and Independence, the industry has expanded until it now embraces more than a dozen shipping points, situated mainly on the Illinois Central Railroad which divides Tangipahoa Parish, the center of the famous Florida Parishes berry belt. It also extends along lateral, short railways in Livingston, St. Helena, and St. Tammany parishes. There are some commercial plantings on the western side of the Mississippi in Louisiana, but these are small in comparison with the plantings in the Florida parishes. Some of the leading towns that now load out berries in car lots daily during the season are Hammond, Independence, Ponchatoula, Amite, Tickfaw, Albany, Denham Springs, and Montpelier.

The crop brings a lot of money into the country, \$4,000,000 being the estimate placed on the commercial shippings of the crop of 1924. The industry has done a great deal to develop Tangipahoa Parish and adjacent berry producing areas, making it possible for the communities to go forward in the march of progress after their first major industry, that of logging and sawmilling, had become a thing of the past.

The Florida Parishes (so called because these counties were a part of the western fringe of Florida under Spanish dominion) are very important links in the chain of the southern strawberry industry, which includes, among others, the Plant City (Florida) district, the areas of western Tennessee, the Ozark district of Arkansas and Missouri, and the Chadbon district of North Carolina.

Different climatic conditions, different soils, and other different local conditions have caused the growers of the Florida Parishes to evolve methods of cultivating and packing and marketing somewhat unlike those practiced by growers elsewhere. It shall be the purpose of the writer in this brief survey to describe the methods in use in Louisiana, setting them down for what they may be worth to commercial growers in other sections.

## Planting and Cultivation

The Klondike is the variety most generally grown in Louisiana. Local men name Independence as the actual birthplace of this berry, the propagator's name being Cloud and the time about 1896. The berry is medium in size, deep crimson in color, fair to good in quality, and its texture is firm enough that it holds up well. The Klondike is grown almost exclusively in the South Atlantic and Gulf Coast states, except in the Plant City, Fla., district (where the Missionary is the leader), as well as in certain parts of North Carolina and Tennessee. It is also grown extensively in southern California, Arkansas, southern Illinois, Maryland, and Delaware. The Klondike is considered one of the best shipping varieties, and it is especially adapted to marketing on a commercial scale. Because of its deep red color and firm texture, it is well liked in the open market and is one of the best varieties for canning purposes. The

foregoing statements about the Klondike are taken partly from a "Summary of the Louisiana Strawberry Deal, Season of 1924," by R. H. Lamb, issued March, 1925, by the United States Department of Agriculture.

Plants are not set in the spring as

Tennessee and northern regions, plants for the next season's crop are set the spring before they are to fruit, and they are allowed to make runners; in fact, the object is to secure as heavy a matted row of plants as possible. In Florida and Louisiana,



A strawberry loading scene at Independence, La., during the shipping season

in Tennessee and other berry growing districts north of Louisiana, but they are set in the fall, the heaviest plantings being made in October and November. In Florida a wide bed is thrown up by a turning plow, and two rows of plants are set on this bed. In Louisiana some growers prefer the wide bed with two rows of plants, but favor seems to go to the narrower bed on which is planted only one row. In

the individual hill method is used, the berries being borne only on plants set the fall before.

From crest to crest the single-hill berry rows in Louisiana are about two and one-half feet apart, and plants are set from six to 10 inches apart in the rows. The soil that has been found to be best adapted for berries is a rather heavy silt loam with a clay subsoil. It requires fertilization.

Some growers buy their ingredients and mix their own fertilizers. The majority buy commercial mixtures outright, a grade of 10-2-2 and another of 10-4-4 being those most commonly used, in which the first figure represents phosphoric acid, the second ammonia, and the last potash.

The fertilizers are added to the soil when it is being put into condition for setting, usually by opening a furrow with a turning plow and then scattering the fertilizer in the furrow by hand, after which the plow is used to bed the soil back upon the fertilizer. Usually another application of cottonseed meal or some such fertilizer is made when the plants are scraped and just before they are mulched.

If the rows become "woolly" with foreign vegetation before mulching time, they may be barred off with a turning plow, and the vegetation between the plants picked out with a hoe, after which the soil is returned to the plants by a shovel plow, as is done in Tennessee.

The usual method is, however, to scrape the plants with a hand hoe, taking care to remove just as little of the soil from near them as possible in getting the vegetation out. Following this, the application of winter fertilizer is made. Then the mulch is applied at once. This operation usually takes place in January. The mulch of pine straw needles is distributed by a man who carries a large apron of it and throws it in a more or less regular layer on the crest of the rows. He is followed by a man with a sharp pointed stick, who works the straw in under the plant leaves, leaving the bud out so that growing will continue. The object of the mulch is to keep the ripe fruit out of the sand and dirt and not to act as a winter covering against the cold, as is generally believed by northern growers when they first hear of mulching in Louisiana berry fields.

It requires from 12,000 to 14,000 plants to set an acre. Growers usually raise their own plants, letting some of the rows of the spring season put out runners. Last season, on account of the drought, many plants were imported from Arkansas. The drought has increased the interest in irrigation. Artesian wells can be sunk in the Louisiana district at reasonable cost.

## Harvesting and Field Handling

The labor to gather crops of berries as extensive as are those in Louisiana is usually a problem. The farms planted to berries are usually small, ranging in size from two to 20 acres, with very few reaching the higher figure. On the smaller farms gathering is done by the family and neighbors. Negroes from the sawmill towns and travelling fruit pickers, known popularly as hoboes, are also used.

Berries are picked and dropped into pint boxes. Each picker carries from eight to 10 of these pints in a wooden hand frame. When he fills his frame, he takes the berries to a field shed, where each box is poured out on a gunny-sack covered table. The packers cull out the defective berries and then place them back into the pint

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## EDITORIAL

Study Your Trees—Pruning Shrubs—Quarantine as an Embargo—Turn County Agents Loose on Co-operative Marketing

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# The Blackcap Industry of the Northwest

By W. S. Brown  
Oregon Agricultural Experiment Station

WHEN one eats a rich, luscious black raspberry picked fresh from the vines, he wonders why this fruit is not more popular, both with the grower and with the consumer. After he has looked at some of the little seedy excuses for berries that he often finds on the market, he may wonder why any of them are grown.

In successful black raspberry growing a few factors stand out prominently. Among these are the production of a high quality product, high yields, the keeping down of growing expenses, and efficient marketing. In order that these ends may be achieved, certain fundamentals must receive consideration, such as the selection of soils, the maintenance of fertility, proper pruning, control of insects and diseases, careful harvesting, successful marketing, and selection of proper varieties.

## Soils

The black raspberry loves best a sandy loam soil, well supplied with humus and moisture. Under far western conditions, such soils must be irrigated to produce the best results. Where irrigation is not practiced, deep friable silt, or light clay loam soils, are more retentive of moisture and will give greater yields than the lighter sandy loam types. The blackcap will not thrive well on heavy clay loams or above heavy clay loam subsoils that come too close to the surface, and it will not tolerate a high water table either in summer or in winter. Good drainage is absolutely necessary.

## Cultivation

The best cultivation should be given blackcaps throughout the whole season if one wishes to obtain heavy yields and high quality. This means that a good dust mulch of finely pulverized earth must be provided as early in the season as possible, and must be maintained not only up to harvest time, but through the picking season until the cover crops are sown and the fall rains begin. After each picking, it is good practice to give the plantation a light cultivation in order to prevent evaporation caused by the tramping of the soil by the pickers.

As cultivation is one of the most expensive operations in the berry patch, there should be careful planning to save labor wherever possible. Plants should be set far enough apart so that they may be cultivated both ways, at least for the first cultivation in the spring. This can be done only when plants are not trellised. Commercial plantations are now being set with plants four feet apart in the row, and rows seven or eight feet apart. This allows for careful cultivation between the rows with a team or tractor, and at least one cross cultivation can be given with a cultivator and single horse. This cross cultivation turns up the runways of mice during the winter and destroys many weeds along the rows.

The tools used should be adapted to the soil and for getting about the plants easily. Great care must be taken not to plow too deeply next to the rows because black raspberries are rather shallow-rooted. A depth of two

or three inches should be obtained near the plants, though the plow may go four to six inches near the center of the rows. An ordinary working plow with an adjustable beam, or an off-set to keep the horses away from the plants, is good for the berry patch; or a tractor well equipped with a hitch which will enable the plow to get close enough to the plants without damaging them, is satisfactory. Generally speaking, the track-laying type of tractor works best among berry vines, because it does not break down the canes, but wheel-type tractors may be used if precautions are taken to place guards over the wheels in such a way as to fend off the plants.

If a tractor is used, one of the best types of disks that can be employed is the tandem reversible, with a goose-neck connection between the front and the rear disks to allow for turning. With such an implement, one can set the disks to throw either away from or towards the plants, or can leave the soil practically level. The ordinary reversible horse-drawn disk may be employed to good advantage also. When the ground is too stony for disking, the spring-tooth harrow may be used to drag the soil after plowing. It is not so good a tool as the disk, however. Following either disking or harrowing, should come careful work with the spike-tooth harrow in order to finely pulverize the soil. Following that, the Kimball or cyclone types of weeders are excellent and are becoming more and more popular. These can be obtained in widths that will fit the space between the rows. They consist of blades fastened to a plank in such a way as to cut through the soil and leave it in a fine dust mulch condition. The operator may ride the tool if it is necessary to get greater depth. These small weeders are usually pulled by one horse. The Acme weeder is also a good tool for this purpose.

One of the most useful labor saving devices drawn by one horse is the grape-hoe. This tool is guided by means of a disk fastened to the left handle and has an extension arm running to the right. Upon this arm different attachments can be placed, one of them being a blunt plow, which enables the operator to cut out most of the weeds around each plant and along the row. Other attachments enable him to keep the soil in a fine condition. No matter how many good horse tools may be used, there will always be some work to be done by hand. The best implement for that is the heavy shuffle hoe.

## Irrigation

A word should be said about growing berries under irrigation. The rows should be so planned as to permit a gentle fall in the direction of the rows. Usually two drills for conducting water in each open space is sufficient. Irrigation should begin as soon in the spring as the soil shows the need of it, and should be continued until about

one week or 10 days before harvesting, when it should be stopped to allow the fruit to become firm enough for picking. Some irrigation should be given after the harvest is over in order that the young plants may make a good growth. Irrigation never entirely takes the place of cultivation. Careful cultivation must supplement the application of water in order to break down the plant foods contained in the soil. Cultivation conserves the moisture supplied by irrigation, and in that way saves large amounts of irrigation water.

## Fertilizers

These may be of two general kinds; the organic fertilizers such as barnyard manure, cover crops, etc., and inorganic mineral salts.

One of the best ways of preparing land for black raspberries is to turn under 10 to 15 tons per acre of stable manure early in the fall before the young plants are set. Young plants may be set either in fall or early spring. When such a treatment is given, young vines have been known to bear quite a crop the second year from planting. Without plenty of fertility in the soil, very little fruit will be borne before the third year.

Whenever stable manure is applied after the canes have been planted, it often leaves a heavy residue of weeds which is hard to get rid of.

An easier and usually cheaper method of maintaining fertility after planting is by sowing cover crops from time to time. Land treated in this way will have its physical texture improved, and as a consequence, will hold moisture better and will produce larger sized fruits and greater yields. Cover crops should be drilled in as a rule during the last of August or the first week in September, and should be plowed under the following spring, as late as possible without having the cover crops become too woody, and before the land has been seriously dried out by them.

As is well known, all members of the legume family are, when inoculated, hosts to bacteria which have the power of fixing free atmospheric nitrogen in nodules on the roots. In this way, the legumes are able to supply a large part of the nitrogen necessary to the growth of plants. This is a cheap way of obtaining this valuable fertilizing element. One should be sure to see that the seed is properly inoculated with the organism which grows upon that particular variety of legume. Cultures of the inoculation bacteria can usually be obtained by writing to one's state experiment station. One of the best legumes for planting west of the Cascades is the common spring vetch (*Vicia sativa*). This is usually sown with some companion crop, such as winter barley or gray oats, because it does not lodge so badly and appears to grow better. For colder regions in the Northwest, the hairy vetch (*Vicia villosa*) should be substituted for

spring vetch. In addition to the nitrogen obtained in this way, the cereals in the combination contribute a large amount of fiber, which is an advantage in loosening the soil. In these combinations, vetch is usually sown at the rate of 30 to 40 pounds to the acre, along with 25 to 30 pounds of winter barley or gray oats.

Of the various mineral salts which are commonly used, nitrate of soda is the most popular. Where irrigation is practiced, this salt can be applied two or three times during the growing season, but where irrigation cannot be carried on, it should be scattered near the plants (but without touching them), about the first of March, before the spring rains have ceased. It is necessary for rains to dissolve this salt and wash it down to the roots of the plants to make it available. From 200 to 300 pounds to the acre is the annual dressing.

It is found in some cases that the berries are not firm enough to hold up well in shipment or in the can. Potash seems to have the effect of firming up the berries (though we do not have as much information upon this as we would like) and for that reason potash is often applied to the land at the rate of 100 to 150 pounds per acre, in the form of muriate of potash. Super phosphate, at the rate of 200 to 400 pounds to the acre, is frequently applied to furnish sufficient phosphorus to balance the nitrogen and potash.

For the requirements of an average crop, most of our western soils have sufficient potash, and in many cases the phosphorus is abundant enough, but for forcing large crops from the soil, the three elements above mentioned will probably be needed in most cases.

The best way for the grower to tell when one or more of these fertilizers are needed is to lay off a few plots in his planting and treat them with each of the above fertilizers, and also with combinations of them. Check plots without fertilizers should be left at intervals in order to get comparisons of yield and growth.

Often as much money may be thrown away in applying fertilizers not needed as in not having the ground fertile enough.

## Pruning and Training

Blackcaps should be pruned three times a year. To prune intelligently, one must remember that the canes are biennial, that is, they make their vegetative growth the first year and fruit the second. The first pruning west of the Cascade Mountains comes in the latter part of February or in March, after danger from winter die-back is past. East of the Cascade Mountains, this pruning should come somewhat later. The pruning consists of thinning out the weaker canes, leaving from four to seven in the stool, the number depending upon the vigor of the vines and upon any winter injury or disease observed. After the thinning has been done, the side shoots or arms should be cut back to leave seven or eight good fruiting buds. Only vigorous side branches should be left. If these side branches are cut too

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Left—A black raspberry plant properly pruned and the canes tied together with hemp twine. Center—Youngsters earning their first pennies in a black raspberry patch. A good crop of Plum Farmers. Right—An elevated brush burner in operation. It will burn canes as fast as two men can collect them.



# Peach Thinning and Peach Profits

By C. D. Matthews

North Carolina Agricultural Experiment Station

**T**HE PEACH deal of 1924 was filled with lessons for observant peach growers. An analysis of the situation brings to view one outstanding lesson which, if thoroughly learned by the mass of peach growers, will not only benefit them individually, but will go a long way toward putting the peach industry on a sound and profitable foundation. This one lesson proved conclusively that the production and marketing of peaches of high quality was profitable, while peaches of low quality were handled at a loss.

In other words, the success of commercial peach orchards was measured largely by the quality of the product sent to market, and the orchards were successful to the degree in which they shipped high quality fruit. By high quality fruit is meant fruit that will size 2-1 or 2-2 when packed in the Georgia carrier, and will grade U. S. No. 1 or U. S. Fancy No. 1. Fruit that sold for a profit last year was of large size, good color and condition, and packed in a high class manner, as an examination of the market reports will disclose. For example, the market report of July 7, 1924, quotes Fancy 2-1 Carmens \$3 to \$4.25 a crate; 2-2s \$2.50 to \$3.50; 3-2s \$2.25 to \$3; with small sizes and poor stock ranging from \$1.50 to \$2.50. The same report shows Fancy 2-1 Hileys selling at \$4 to \$4.50, and occasionally \$5; 3-2s selling at \$2.50 to \$3.75; small sizes ranging from \$2.50 to \$3 and lower.

## Thinning in Relation to Peach Profits

A chain is as strong as its weakest link. In peach production each cultural practice must be as thorough as it can be made, if the best fruit is to be produced. The chief cultural practices are pruning, spraying, cultivation, fertilization, and thinning. A lack of thoroughness in any one of these cultural practices will become the limiting factor in success. In years of normal or over-normal production, thinning takes equal rank with the other operations.

Peach thinning and peach profits were closely associated in 1924 in many peach sections. During last season thinning was neglected to a greater extent than any other factor in the production of high-class fruit. There were individual orchards in which the same cultural program was followed as in other orchards, with the exception of thinning, that failed to make expenses, while orchards that were thinned made good profits under the unsatisfactory conditions prevailing last year.

The importance of producing fruit of high quality, good size, and condition has never been so pronounced as it is now. Competition is becoming keener each year between the different fruit sections of the country, and also between different fruits on the market. The buying public each year is becoming more discriminating in its choice of fruit, and leading growers and co-operative associations are learning the importance of this fact. For these reasons, the practice of thinning is now assuming a very special importance. It has been demonstrated time and time again in the leading peach sections of the country, that in normal seasons no work in connection with peach growing pays more than this operation; yet its practice is the exception rather than the rule.

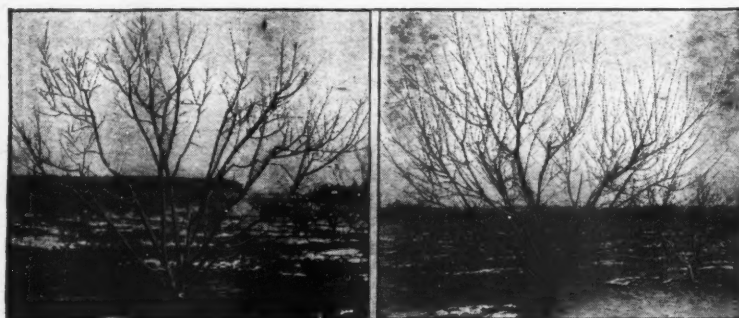
## Reasons for Thinning

The peach naturally produces a large number of fruit buds each year. If no damaging freezes or frosts occur, and if the fruit is not thinned, the trees are liable to be overloaded and have more fruit than they can bring to maturity in the best condition. Peach trees in their attempt to reproduce their kind, strive for the production of a maximum number of seed. A small fruit is as efficient for this purpose as a large one; consequently, the trees attempt to carry all the peaches that will set. The trees can only elaborate so much plant food

each year for maintaining themselves, making new growth, and maturing the crop of fruit they bear. It can readily be seen that if this food has to be distributed over an excessive amount of fruit, the individual fruits will be small and the trees will likely suffer from the drain that is put upon them. Thus, there are two principal reasons why

amount of wood growth and this, together with the broken limbs that generally result from over-bearing, reduces the crop for the following year. Thinning of the fruit prevents overbearing and a sufficient number of strong, vigorous fruit buds are formed each year for a good crop.

In southern peach sections, thinning



Left—The fruit on this tree was not thinned. The general condition is weak, the twig growth is poor, and there are few fruit buds, all due to over-bearing. Right—The fruit on this tree was thinned to a minimum of six inches apart. The tree is thrifty, twig growth is good, and there is a good setting of fruit buds

peaches should be thinned if the trees are heavily laden. First, the effect upon the trees; second, the effect upon the fruit.

**The Effect of Thinning upon the Tree**  
Seed production is a very exhaustive

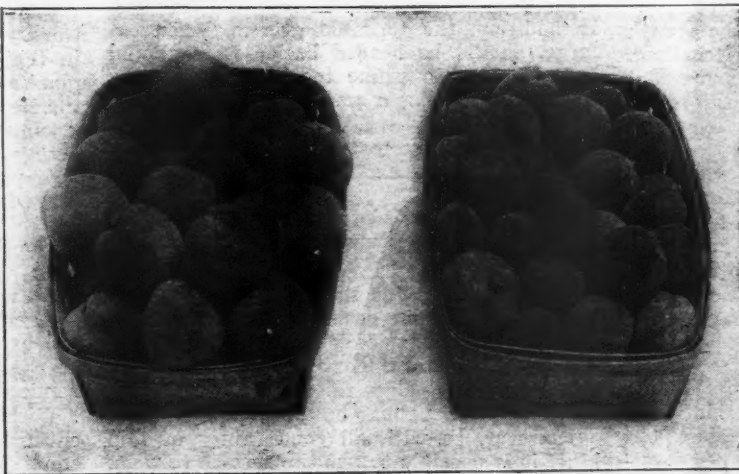
process upon the plant. Other processes, such as the production of foliage, green shoots, etc., assist in the assimilation of plant food, but the seed assimilates practically no food. On the other hand, it removes a large amount of assimilated food from other parts of the plant, which it stores up for the young embryo.

The practice of thinning allows trees

the fruit has an effect on the hardness of the buds. Trees which are thinned have fewer buds killed than those that are not thinned. This effect of thinning, however, is indirect in that the rest period is influenced rather than that the buds are made more hardy.

## The Effect of Thinning upon the Fruit

Thinning influences size, quality, color, and uniformity of the fruit. It is the desire of every fruit grower to



The peaches on the left came from a tree that was thinned; those on the right were taken from an unthinned tree. Both lots are fair samples

to make proper growth. They are capable of taking a certain amount of plant food from the soil for growth. An excessive setting of fruit is apt to appropriate most of this food at the expense of good thrifty growth. Also, with heavy crops there is breakage of the limbs, and broken branches are an easy gateway for the entrance of disease. When peach trees produce an excessive crop, there is a lessened

produce fruit of good size, color, and high quality. In the case of trees bearing normal or above normal crops, there is no factor which contributes more to the development of high quality, good size and handsome appearance than thinning of the fruit. A highly-colored peach will have a quality superior to that of an uncolored peach from the same tree. The more highly colored peaches always com-

mand a better price on the market. Trees which have been properly thinned produce fruit that is much more uniform in size and quality, and ripen their crops more evenly. There are fewer culls.

## Results from Thinning Elberta Peaches

With the idea of determining the value of thinning peaches, and to gain some information of the correct amount to thin, investigations were carried on at the North Carolina Experiment Station for two years, with a number of varieties of peaches. The results secured with the Elberta variety were typical and are given to show the value of thinning in increasing the size and quality of peaches. This work was done in years when the trees were bearing heavy crops.

## Time and Amount to Thin

Peaches should be thinned immediately after what is known as the "June drop," which occurs in the North in June and in the South in May. The operation should be performed as early as possible after it can be determined how large a crop the trees are likely to carry.

The proper amount and distance to thin will depend upon various conditions, such as age and vigor of the trees, size of the crop, fertility of the soil, moisture supply and amount of pruning. It is largely determined by experience. Some varieties, like Mayflower, Greensboro, Dewey, and Old Mixon, require more thinning than others. Old trees as a general rule need more than younger trees. The more vigorous the trees, the more fertile the soil, and the more moisture there is available, the less the amount of thinning to be done. The difficulty with most beginners is that they do not remove enough fruit. It takes considerable nerve to thin all that is necessary.

The proper distance to thin requires more judgment on the part of the orchardist than almost any other orchard operation. Experiments conducted at the North Carolina Station show that under normal conditions peaches should be thinned to a minimum distance of from four to six inches apart. Taking into consideration the health and longevity of the tree, six inches as a minimum distance will be found to give the best results. To some growers this may seem excessive, but all experimental evidence goes to prove this to be about the best distance.

## How to Thin

Thinning requires very careful and well trained help if the work is to be done properly. Some thinners pull off enough peaches, but have no regard for distance and spacing and to the welfare of the trees. Going through an orchard after a gang of careless thinners, one often finds a sufficient amount of fruit removed, but the trees are so abused that the foliage appears ragged. Careless workers who persist in pulling the fruit off roughly should not be tolerated, as this practice loosens much of the remaining fruit and breaks off leaves and twigs.

In the thinning operation, it is very important to go over the trees systematically. If this is not done, the operator never knows when he is through. In starting to thin a branch, shake it first, and in this way a number of fruits that would drop off later are removed, thus saving the time necessary to pick them off. Next, remove all defective fruits, such as wormy or diseased ones, those that are undersized, and those that show limb bruises or other mechanical defects; then thin down to a uniform distance apart.

When the operator gets through and looks at the ground, he is sure he has taken off too many, but when picking time comes he almost always wishes that he had taken off more. If it seems, late in the season, that an insufficient amount of fruit was re-

(Concluded on page 19)



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## Study Your Trees

**T**HE INVESTIGATIONS of the past few years have shown that a very definite relation exists between growth and fruitfulness. The fruit buds are formed the year previous to the one in which the fruit is produced. If there is a small amount of growth, few or no fruit buds are formed. If we get too much growth, there are also few fruit buds formed; this condition sometimes prevails in young trees but it rarely occurs in mature trees. The best fruit bud formation takes place when a substantial moderate growth is obtained.

It has also been learned that it is important to have the right amount of growth regularly. A large amount of growth one season, followed by a small amount the next, is not conducive to proper fruit bud formation. Circumstances of this kind tend to form biennial bearing habits, which are hard to break up.

It has also been discovered that the growth and fruiting processes are largely localized. While there is without doubt some movement of finished food materials from one part of the tree to others, it has been pretty definitely proved that the food manufactured by a certain branch or part of the tree is used to a large extent for the needs of that branch or part.

It has been found that the active growth of twigs and fruit spurs very early in the spring is quite beneficial in stimulating the set of fruit. It is for this reason that nitrogenous fertilizers applied early in the spring have given such good results.

We have learned that it is advisable for growth to continue until fruit bud formation is fairly well advanced. A stoppage of growth too early tends to interfere with the proper development of fruit buds. Growth should not continue too long, however, or winter killing will result.

Back of all of these practical results lies an important fundamental principle. For the best fruiting results, there must be a proper balance between the carbohydrate and nitrogen content of the trees. Such a balance results in the right amount of growth and in proper fruit bud formation.

With these important factors in mind, we need scarcely emphasize the importance of

studying trees carefully during the growing season. If you have never studied your trees, begin doing so this season. Note how they start their growth. Is it active or does it lack vigor? Does the foliage have a good color or is it pale in color and sparse in amount? Do the fruit spurs seem vigorous or are they weak? Are the trees making a good annual growth or is it too large or too small? Are your trees making the proper amount of growth all over or are they making a fair growth in the tops and a poor growth in the lower portion? Are your trees open enough so that fruit buds can form all over them and so that the fruit will color up well?

We urge every one of our readers to study his trees this summer. Find out what kind of growth is giving the best results in your orchard. Make a study of the amount and kind of growth being made by the trees which are doing well, then compare these with the growth being made by the trees which are not doing well. You can then vary your treatments so as to change the growth of your trees and thereby improve their performance.

The best time to make such a study is during the growing season. We urge that you try the plan this summer. You will find it a paying proposition.

## Pruning Shrubs

**M**ANY shrubs are grown largely for the flowers they produce, and, naturally, it is desired to promote flower production in every way possible. Many mistakes in pruning shrubs are made.

It is common for fruit growers to prune the shrubs in the winter, that is, if they prune them at all. This practice is all right in the case of shrubs grown for foliage, but it is not productive of the best flowering results.

Most shrubs produce their flowers on the wood of the previous season's growth, the flower buds having been formed in the late summer of the previous season. Pruning in the winter or early spring decreases the supply of flower producing wood and thereby decreases the production of flowers.

The best time to prune most shrubs is in the summer, just after the flowers are produced. By this means, flower production for the current year is in no way interfered with. Furthermore, the pruning is done before the flower buds for the following season are formed.

In pruning shrubs, the superfluous and injured main branches should be removed. In addition, the terminal growth, when too large, should be headed back. Care should be taken not to prune too heavily. Shrubs which are making a weak growth should be cultivated and fertilized. A good wood growth is essential for the best flower production.

## Quarantine as an Embargo

**T**HE QUARANTINE service of the Federal Horticultural Board has been a good thing for the fruit industry and for the country in general. Undoubtedly it has been the means of keeping out of the country, or of delaying the entrance of, many serious insects and diseases. It is a valuable service, and it ought to be continued.

However, as with all good things of this kind, it is possible to use the service in ways that may prove detrimental sooner or later. We are not taking the view that this service has been used in that way to date, but we do believe the administrators of this service should proceed cautiously and make certain that their feet are resting on solid ground at all times.

As long as the service is being handled to prevent the introduction of foreign insects and diseases not now prevalent in the United States, there can be no question as to its conduct, but there is always danger, because of

the pressure brought by over-zealous groups, that such service may be applied primarily for the purpose of preventing importation of foreign products.

We must not forget the fact that we are still more or less dependent on foreign trade. If we should happen to use the quarantine service for embargo purposes, there is little doubt but that other nations will retaliate, that is, if they can do so. The question was raised the past winter when Great Britain established an embargo on potatoes from the United States on the pretense of preventing the importation of the Colorado potato beetle into the British Isles. Of course, in this case it seems that the English embargo was out of place, because no embargo was placed on Canadian potatoes, where the Colorado potato beetle is present also. But the incident at least suggests that our authorities should proceed carefully in the application of our quarantine laws to the importation of foreign products.

Let us be careful to use the quarantine service for prevention of the introduction of foreign insects and diseases, the purpose for which it was intended. If we want to prevent the importation of foreign products, let us do it by a high tariff or by some means which can be justified and not on the ground that such products are infested with insects and diseases. Let us not use the quarantine service for embargo purposes.

## Turn County Agents Loose on Co-operative Marketing

**I**N PAST years it has been the policy of the Department of Agriculture to discourage county agents from actively promoting co-operative marketing. The view has been that since a county agent received a part of his salary from the government, he was, in part at least, an employee of the government and that he should therefore serve the entire public rather than just agriculture. Since some groups of the public are opposed to co-operative marketing, it was considered inadvisable for county agents to support co-operative marketing. Some states have taken the same view because they have also contributed to the salaries of county agents.

Our national viewpoint toward co-operative marketing has changed materially in recent years. We now have several national laws which have practically committed the country to co-operative marketing and which define the rights and limitations of co-operative associations. The platforms of the leading parties in the last campaign contained very strong planks in favor of co-operative marketing, and the Republican administration has repeatedly committed itself in favor of co-operative marketing in unmistakable terms. Many states have passed co-operative laws in the last few years in which the promotion of co-operative marketing has virtually been made a matter of public policy. All along the line there has been a marked change in our national and state viewpoints toward co-operative marketing and there is now no question but what the encouragement of co-operative marketing has been adopted as a general policy in our economic development.

With this in mind, the Department of Agriculture and the various states should turn the county agents loose on co-operative marketing and allow them to proceed full steam ahead in promoting the movement in every legitimate way. It is altogether inconsistent for government and state authorities to take any other attitude under the circumstances. Of course, certain groups will always oppose co-operative marketing, but this is not sufficient justification for obstructing the movement. Every good movement is opposed by someone. If we obstruct a good movement just because someone opposes it, we shall never make any progress.



# Apples or Cedars in the Fruit Industry

By T. J. Talbert

University of Missouri

**T**HE FUNGOUS disease commonly known as cedar rust or apple rust has caused serious injury to the apple from the beginning of the commercial apple industry in many important fruit sections. The damage during some years has been much greater than during others. The evidence at present indicates that cedar rust has steadily grown worse for the past five years in orchard sections where the red cedar is abundant. It would be difficult to make an accurate estimate of the yearly damage done to the apple crop. From the information available, it is conservative to estimate the annual loss of the apple fruit in Missouri alone at from \$25,000 to \$50,000. This does not take into account loss of tree vigor by premature defoliation, reduction in the size of the affected trees, and the shortening of the life of the orchard.

## Where Cedar Rust Is Found

Cedar rust is found in practically all of the orchard sections of central, eastern and southern United States. The disease appears, however, to be most serious in the southern part of the apple growing districts of the several eastern and central states. The states reporting the greatest injury are as follows: West Virginia, Alabama, Virginia, Indiana, Illinois, New York, Ohio, Kentucky, North Carolina, Missouri, Kansas, Arkansas, Nebraska, Iowa, and Wisconsin. In the central and eastern parts of the country, wherever apples grow in the vicinity of the red cedar, the disease is generally serious and of great economic importance.

## Susceptibility of Apple Varieties

Commercial varieties show more marked differences with reference to resistance to cedar rust fungus than to most fruit diseases. In general, the varieties most susceptible to the disease are as follows: York, Rome, Wealthy, Jonathan, Benoni, Red June, Minkler, Smith Cider, and Payne's Late Keeper. The most resistant varieties may be listed as follows: Winesap, Stayman, Arkansas, Grimes, Transparent, Maiden Blush, Northwestern Greening, and Duchess. Ben Davis, Gano, Aikin and several other varieties are considered moderately susceptible.

## Injury to the Leaves

The first appearance of the disease on the leaves is indicated by small, light-yellow-colored spots. These spots gradually become larger and usually take on a brighter orange color. Near the center of the orange-colored spots on the upper sides of the leaves, very small, dark dots appear. Beneath the yellow spots on the under sides of the leaves are formed cup-shaped structures. These produce spores, during July and August, which are carried by

the wind to the cedar trees. The leaf tissue, though affected by the fungus, does not die readily but generally remains alive during the greater part of the growing season. The region of the leaf in which the infection occurs becomes swollen or enlarged, and when the leaf is seriously affected, the whole leaf is enlarged considerably and the edges of the leaves may curl back in an unusual manner.

Leaf infection occurs early in the

The fungus has two hosts or food plants, the red cedar and the apple, including the crabapple. Cedar rust is confined to the red cedar. Other evergreens are not affected by this fungus and may be grown near apple orchards without danger of injury. On the red cedar the fungus produces brown, corky appearing galls, which are commonly known as "cedar apples" or "cedar flowers." The fungus is injurious to the red cedar, and when it be-

spot may be observed. The leaf spots continue rapid development and in about two months send out clusters of fruiting bodies on the under side of the leaf, forming cup-shaped structures. The spores produced do not reinfect the apple but are carried by the wind back to the cedar trees, where infection occurs on the tender leaves of the red cedar.

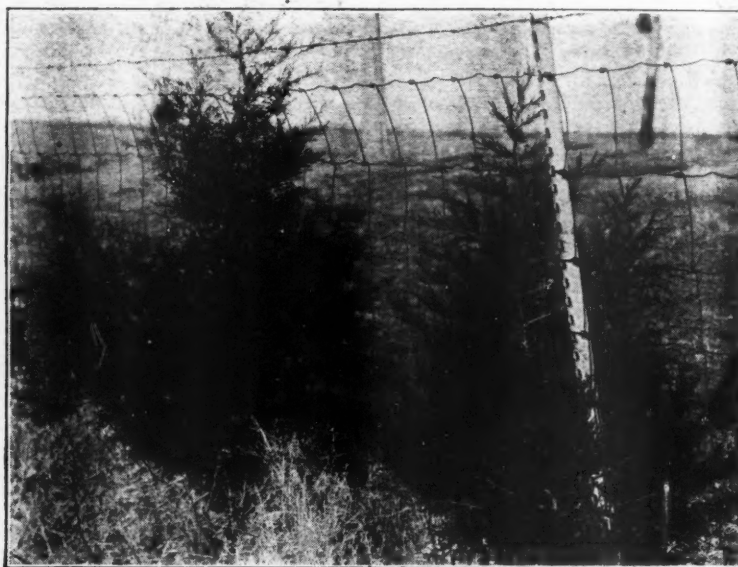
## Control Measures

Since the foliage and fruit of apple trees may become infected in the spring after each rain or damp spell of weather, it is practically impossible for the apple producer to spray his orchard often enough to obtain satisfactory control of the disease. It is true that sprays as they are generally applied for the control of other diseases assist some in the control of cedar rust. Rarely, if ever, will the regular sprays be adequate when the cedar rust is serious. It is a well known fact, as every grower knows, that in the springtime the orchardists may experience, in one week, five or six or more rainy or damp periods followed by drying conditions and, consequently, as many different disseminations of cedar rust spores. Spraying is, therefore, not a remedy upon which the grower can rely.

The disease also differs from other fruit diseases in that the spores or "seeds" of the fungus germinate quicker, thus requiring the application of a spray soon after the spores alight upon the foliage or fruit if injury is to be prevented. Much work has been done upon the problems of time of application and spraying materials to use for the control of the disease. These tests and experiments have shown that it is impractical and uneconomical for the grower to attempt to control cedar rust by spraying. Apple growers and investigators, therefore, are of one accord in the opinion that the only satisfactory way to prevent serious damage from cedar rust is to destroy red cedars in the vicinity of apple orchards. Since the red cedar does not sprout from the stump or stub, one cutting is sufficient. It is important that every red cedar tree to a distance of one and one-half to two miles be cut if satisfactory protection against the disease is to be afforded.

One small red cedar tree may spread to the wind enough spores to cause great damage to a commercial apple orchard. Where it is necessary, however, to leave a few cedar trees, they may be prevented from spreading the cedar rust by carefully cutting and burning the galls or cedar apples on the red cedar trees. For the work to be effective, the cedar trees must be inspected each year from the ground to the tops and all the way around the

(Continued on page 28)



Runt, scrubby cedar trees like these growing in the fence rows are a menace to the apple industry

season when the leaves are small. Exact dates cannot be foretold accurately, as the infection each season depends greatly upon weather conditions. In general, the first infections occur in the Ozark section about April first or at the time when the first apple blossoms open, and the period of infection usually extends until the latter part of May or the first week in June. In sections further north, infections occur somewhat later. As the leaves grow older, they gradually develop a resistance to the disease, and rarely does leaf infection occur after the first of June in Missouri.

## Injury to the Fruit

The disease affects the fruit much in the same way that it affects the leaves, although the yellowish or orange-colored spots are larger. Cup-shaped pustules resembling those on the lower part of the leaf surface are developed upon the fruit. The cedar rust spots on the apple usually occur near the calyx end. The spores which are carried by the wind undoubtedly alight on this end of the apple more often than upon other parts of the fruit, because the calyx end is turned upward early in the season.

## Injury to the Trees

When the foliage of the apple trees is affected seriously for several years, the vigor and vitality of the trees are greatly impaired. Such weakened and devitalized trees become easy prey for diseases like blister canker, root rot and crown gall. Fruit tree borers, woolly or root aphids and San Jose scale are also able to make greater headway and do much more injury to trees suffering from a lack of nourishment on account of defoliation. Apple trees so injured generally die in a few years.

## Cause of Cedar Rust

Cedar rust is caused by a parasitic fungus, the technical name of which is *Gymnosporangium juniper-virginianae*, Schw. It has a very complex life history as well as a long, hard name.

comes serious it may finally kill the trees. Unfortunately, however, the susceptible varieties of apple trees are usually destroyed by the devitalizing work of the fungus long before the red cedars suffer seriously.

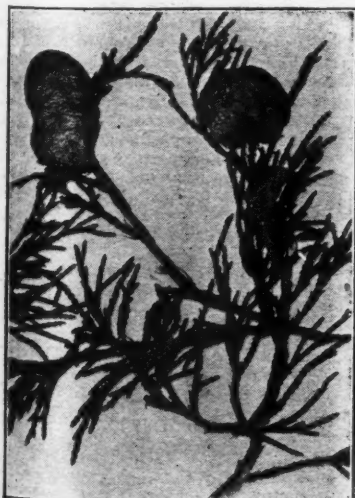
In the spring, about the time the apples bloom, the mature cedar apples or cedar balls on the red cedars produce, during rainy or damp weather, jelly-like horns or appendages. These appendages contain numerous teliospores which germinate, producing small spores, called sporidia. Upon the drying out of the appendages following rains, the sporidia are blown to the young leaves and fruits of the apple. These spores germinate readily on the leaves and fruit of the apple under favorable conditions. The low temperatures often experienced during April and May are very favorable to the germination of these spores.

## How Cedar Rust Is Spread

The spores may be carried long distances by the wind, in some cases as far as five or six miles, or even farther. Generally, however, they are not carried in injurious numbers over a mile and a half or two miles. Since the prevailing winds in the spring are from the west and southwest, apple orchards situated east and northeast of red cedar trees will generally show the greatest infection. No matter what the direction, however, if red cedar trees grow near susceptible varieties of apples, and if weather conditions are favorable, the attack upon the foliage and fruit is usually serious.

## Germination of Spores

Observations and investigations have shown that the spores or "seeds" of the disease will germinate in from three to five hours and cause infection upon the leaves or fruit of the apple. Once the infection gains entrance to the leaves or fruit, spraying is of no consequence in preventing injury. The fungus develops rapidly and penetrates the leaf so that within about 10 days a visible yellowish or orange-colored



Cedar apples in winter condition on the red cedar. Cedar rust damage can be greatly reduced by removing such galls from cedar trees during the winter



Cedar apples or cedar galls with spore horns moist and enlarged as a result of rainy weather. (Courtesy Mo. State Fruit Exp. Station.)



# Factors in Successful Plum Culture

By U. P. Hedrick

New York Agricultural Experiment Station

**A**BOUT a thousand varieties of plums are under cultivation in the United States. These give a greater range in colors, flavors, aromas, forms and sizes than are found in any other fruit. Besides the great variety and variability of the plum, this fruit is distributed throughout North America wherever fruits are grown. There have been more new and radically different varieties of plums introduced in America during the past quarter century than of any other tree fruit.

Unfortunately, however, the plum is not receiving the attention it deserves in any of the fruit regions of America, excepting California. Two reasons account for its neglect in eastern America. California has taken the lead in growing plums and puts on the markets of the country a great diversity of handsome plums with which in appearance the products of eastern orchards cannot compete. The second reason for the neglect of the plum in the East is the prevalence of curculio and brown rot, which takes so great toll that the crops can be profitably grown only with constant and expensive warfare. There can be no doubt as to the demand for this fruit in the East, as figures from western fruit distributors show that from \$7,000,000 to \$10,000,000 worth of plums and prunes are shipped east from the Pacific Slope annually.

Four groups of plums are grown in America; the Domesticas, the Damsons, the Japanese, and a very diverse group of varieties evolved from species native to the country.

## Domestic or European Plums

The commonest plums of the continent come from Europe. They are represented by several quite distinct groups. The plum grower must know these groups in order to determine whether they are suitable for the purpose for which he wishes to grow plums and for his soil and climate.

In quality, the Reine Claude group of Domesticas is most notable. The dozen or more best sorts belong to this group. All of its varieties are sweet and each has a distinctive sweetness; the flesh of all is rich and delicate; all have an abundance of juice, and none is watery; while not brilliant in color, the fruits of most of the varieties are attractive, the colors ranging through the greens and yellows, usually marbled, with tints of white and crimson. Reine Claude and Bavay are the two best varieties of the group. The trees of both of these plums bear young, are productive, and when the crop is thinned, the fruits are large and handsome. Unfortunately, the trees are not hardy, robust, or long-lived.

The prunes constitute the second group of Domesticas. The fruits of the prunes are oval-shaped, usually purple, with firm, long-keeping flesh, which dries into a cured fruit. In eastern America, prunes are best represented by Italian and German, both of which are grown on the Pacific slope as well. Agen and Imperial Epineuse, at least, should be added to the list as sorts worthy of general cultivation. The German and Italian prunes are very popular as culinary fruits. Agen and Imperial Epineuse are dessert prunes, but are nearly as desirable for culinary purposes

as Italian and German. The trees of all are large, hardy, productive and bear regularly. The several varieties of prunes ought to be much more commonly grown than they now are in all plum regions, both fruit and tree recommending them most highly to the plum grower.

The fruits of the Yellow Egg group are the largest and handsomest of all plums. Out of a dozen or more of the Yellow Egg varieties only two, Yellow Egg and Golden Drop, are now much grown. Yellow Egg is fit only for the kitchen and is none too good for culinary purposes. Golden Drop produces large, handsome, well-flavored fruits, but the trees thrive in but few places; they lack vigor, are slow in coming into bearing, and are subject to many ills.

Monarch, Grand Duke, Arch Duke,

little from San Jose scale. Pond is pre-eminent among plums for the large size and attractive color of its fruits. It is, however, a handsome humbug, as the fruits are far below the mark in quality.

## The Damsons

The Damson plums are second in importance to the Domesticas in America. Damsons are commended to all who cannot give the care required to grow Domesticas because the trees are hardier, thriftier, freer from disease and curculio, and are more productive. The Damsons may be grown over a much greater area in America than the Domesticas. Shropshire is the best of the Damsons, and its trees are hardly surpassed among all tree fruits for productivity and regularity in bearing. The fruits of the French

do not keep as well, are more subject to brown rot, and mature more unevenly than do those of Burbank. On the other hand, the fruits of Burbank are larger, of better quality, keep and ship better, ripen a little earlier, and rot less.

## Native Plums

Varieties of native plums are more or less cultivated in various parts of the continent. Most of these are inferior in tree and fruit to the Domesticas, Damsons and Japanese sorts. Native plums have not made a place for themselves in any part of the country excepting in localities where they alone can be grown. Hardiness to cold and heat and freedom from disease are the chief recommendations of the many varieties of the several native plums, although they greatly extend the range of varieties in color and taste of fruit.

## Hybrid Plums

A great number of hybrids between the several species of plums are now

offered by nurserymen. Most of these produce attractive fruits, but nearly all show weaknesses in tree, and the fruits of few can be called high in quality. The fruits of nearly all have a distinctive and peculiar flesh, to which one must become accustomed. The best of these plums are Apple, America, Bartlett, Climax, Golden, Juicy, Shiro, Wixon, Formosa and Santa Rosa. All of these are growing under the writer's eyes and all are disappointments. One prepares his palate, in reading the descriptions of the originators, for melting flesh, juice of nectar, and flavor of ambrosia, but finds instead soft or stringy pulp, watery juice, and a foreign and often disagreeable taste.

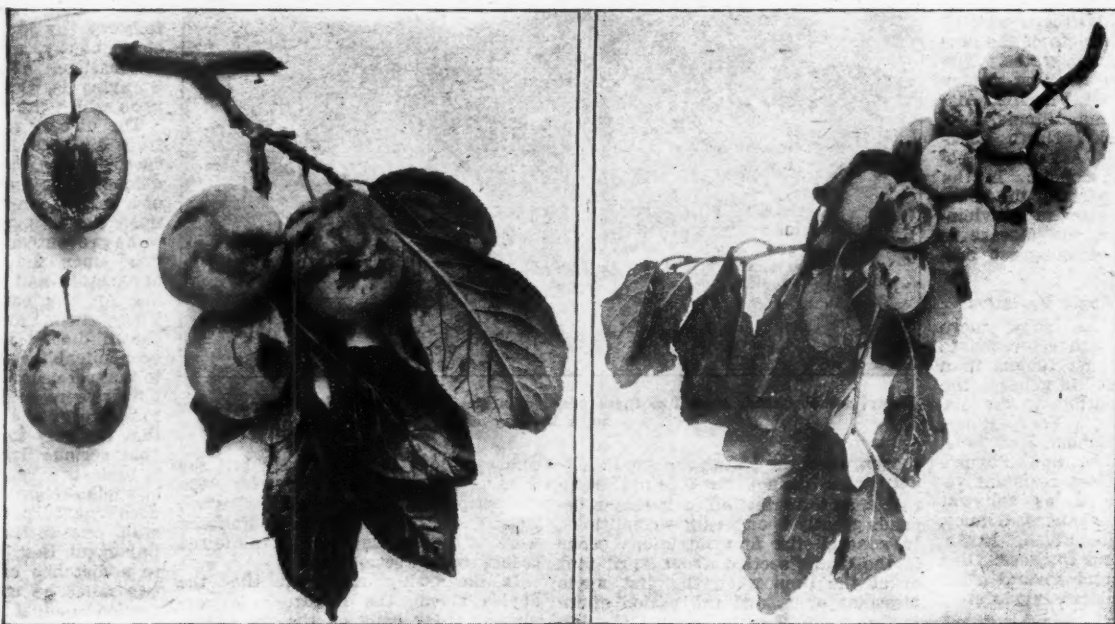
## Soils for Plums

Plums may be grown on most soils suited to general farm products in the regions where the climate permits plum culture. Plums thrive on a great diversity of soils, and one may make the general statement, that, given good fillage, some sort of plum can be grown commercially in every fruit soil. Yet species of plums have very decided soil preferences. The Domesticas and Damsons do best on clays and loams. On such soils the trees are largest, most productive, and the fruits are best in size, appearance and quality. The Japanese plums do best on light loams or sands, and in general thrive wherever the peach is well grown. Some variety of the native plums can be found for every soil and climatic condition suitable for any sort of agriculture in America.

## Stocks

The plum is well grown in America on at least six stocks, and the practices of nurserymen are diverse, depending on the cost of stocks, ease of budding, and the adaptability of the tree to the stock. The New York Agricultural Experiment Station has most of the leading plums growing on six stocks in a test of stocks. On the grounds of this station Myrobalan is unquestionably the best general stock for plums. It seems to suit nearly all varieties of all groups better than any other stock. The St. Julien stock is second best, after which comes, in

(Continued on page 16)



Left—Monarch, one of the best commercial plums. Right—Shropshire, the favorite plum

and a few similar sorts constitute another group. The fruits have thick skin, heavy bloom, firm flesh, clinging stones, and all are poor in quality, but all are attractive in appearance, and the trees are hardy, thrifty and productive.

Of this group Monarch is the best. Its rich purple color, fair quality, and excellent tree characters give it a place among the best commercial sorts. Grand Duke is a favorite shipping plum because of its large size, handsome color, and firm, meaty flesh. The trees of Grand Duke grow poorly in the nursery, but make very good orchard plants, as they bear regularly and abundantly and hold the crop well. Arch Duke bears fruits nearly as large and of the same color as those of Grand Duke, but they are higher in quality, the stone is freer and they ripen earlier.

The Lombard group is best represented by Lombard, Bradshaw, and Pond. The fruits of this group differ from those of the preceding one in being reddish or mottled, and they are smaller. The tree characters are excellent, and were the quality better, the Lombard-like plums would be dominant in eastern America. Lombard is the most grown of the several varieties named because of hardiness, productiveness, regularity in bearing and freedom from curculio. It would be the plum "for the millions" were the quality of the fruit better. Bradshaw is the most deserving of culture of all. The trees are large, well-formed, bear regularly and heavily, are hardy, robust, healthy, and suffer

surpass those of all other Damsons in size, the flesh is nearly free from the stone, and the quality is better than that of any other Damson.

Closely related to the Damson are the Mirabelles, hardly known in this country but accorded first place among all plums in many parts of Europe, where they are used in the fresh state, for prunes, preserves, jellies, jams, candies, and marmalades. In size the fruits of the Mirabelles are a little larger than those of the Damsons. Several varieties of Mirabelles grow well on the grounds of the New York Agricultural Experiment Station, and would thrive wherever Damsons are grown in America.

## Japanese Plums

The Japanese plums have been overpraised and over-planted, and, with the exception of a few varieties, are hardly worth planting in America. Some qualities, however, commend them. Thus, the Japanese plums have a greater range of adaptability to soil and climate than other plums, the trees are very productive, and are nearly free from black knot, leaf blight, and curculio. Their faults are: early blooming, susceptibility to brown-rot, tenderness to cold, poor quality, clinging stones, and soft flesh by reason of which they do not ship well. Abundance and Burbank are the two Japanese plums worth planting in commercial orchards. Red June and October are esteemed by some for home orchards. Abundance is adapted to a great diversity of soils, bears heavily and regularly, but the fruits



# Friends of the Fruit Grower

By M. J. Heppner

University of California

"EVERYTHING that has life has some use in this world."

This is a remark often heard but the truth of it is often questioned. Fruit growers often wonder why the codling moth, plum curculio, aphids, twig-borers, etc., etc., were placed on this earth, for they merely mean trouble, worry, and heavy expenditures in undertaking control measures. These innumerable troublesome pests were undoubtedly created to offer competition to the human race in the struggle for life. Should these pests be allowed entire freedom for a period of a few years they would increase so rapidly in numbers that fruit production, as well as all other types of agricultural production, would be out of the question. Year after year the grower must be on the go, doing his best to keep these pests under control as far as he can do so. He is well aware of what would happen if he omitted control measures for a single season.

Many growers have been forced to take such heavy losses, due to insect pests, that it is no wonder that they are in the habit of killing anything that crawls. Unknowingly, they often do more harm than good, for, as a rule, their battles are pointed towards all insects rather than those which are injurious.

Nature probably made a mistake by creating the innumerable orchard pests, but on the other hand she has been kind in creating other insects for the express purpose of preying on the injurious types. Growers often take all the credit for keeping a certain pest under control by applying recommended sprays. But should they take all the credit? Emphatically no. Were it not for the beneficial insects which assist them in keeping the injurious types under control, spraying alone would probably be of little value. Proper spraying and beneficial insects go hand in hand as far as destroying injurious pests is concerned.

There are several important beneficial insects which all fruit growers should be able to identify. They are really his friends, and the value of the work they do annually is beyond estimation. It is not within the scope of this article to give a treatise of all beneficial insects, for such would require a good sized volume. Only a few of the important ones will be discussed, paying attention to life history, characteristics, and methods of attacking the prey.

## Lady-Bird Beetles

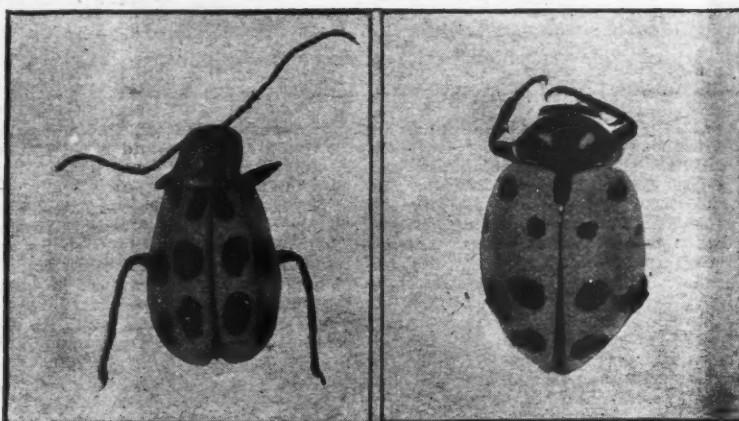
Of all beneficial insects the common lady-bird beetles are of greatest importance. There are several species of this insect, all of which do much towards keeping soft-bodied insects and scale pests under control. Some of the important species are the Common Black Spotted Red Lady-Bird Beetle, Two-Stabbed Lady-Bird Beetle, Vedalia, the Steel Blue Lady-Bird Beetle, and the Striped Lady-Bird Beetle. There are several other species, but the above are representative of the family.

Life histories are nearly the same for each species. That of the Common Black Spotted Lady-Bird Beetle will serve for the entire group. This insect is distinguished by its beet red color and the characteristic 12 black spots on the back. Large colonies of the insect often hibernate throughout the winter in the adult stage in the high Sierras. With the coming of warm weather they leave their winter quarters and migrate to the lowlands.

Close observation during early spring will reveal small masses of cigar-shaped eggs deposited on end on trees, fences, houses, etc. These eggs are generally salmon-colored and typical of the 12-spotted beetle. Some of the other species deposit their eggs singly instead of in bunches. These eggs hatch into larvae which attain a length of about one-half inch. Salmon-colored spots are evident on parts of the body. The beetle at this stage is

very active and consumes large numbers of soft-bodied insects. In order to protect themselves against other insects, many of the larvae give off offensive secretions that repel their enemies.

received from Africa, where it is doing splendid work in mealy bug control. In spring, when mealy bugs are scarce, it feeds voraciously on aphids, and also attacks young scale insects. The value of this lady-bird has already



Left—Twelve-spotted Chrysomelid beetle, a destructive insect often mistaken for the true lady-bird beetle. It can be distinguished from the lady-bird beetle by its long feelers. Right—Black-spotted lady-bird beetle, one of our most beneficial insects

After passing through the larval stage, the insect enters the pupal or resting stage. The pupae may be found on nearly any surface similar to the egg stage. When passing through the pupal stage, the insect generally hangs with the head downward. The pupae finally develop into adults, thus completing the life history.

This particular species of beetle feeds principally on aphids and is generally present when an aphid infestation occurs.

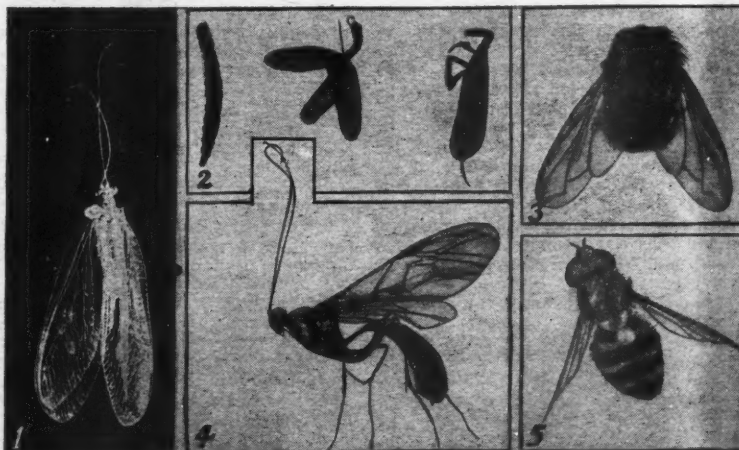
The Two-Stabbed Lady-Bird Beetle is very small and dark black in color, with two round red spots on the back. This beetle is a heavy feeder on San

been demonstrated in California, and before long it is expected to take its place among the beneficial insects.

Another new addition to the California beneficial insect group is the lady-bird beetle, *Oenopia cinctella*, also brought in from South Africa. This beetle feeds upon aphids and mealy bugs. (Descriptions of these two new beetles may be found in the *California Cultivator* dated November 1 and 8, 1924.)

## Close Relatives of Lady-Bird Beetle

There is another family closely related to the lady-bird beetle, called the Chrysomelids, which are very destruc-



1—The green lace-wing fly, the larva of which is among our most important beneficial insects. 2—Larva, male and female, of the Raphidia, which preys on the codling moth. 3—Tachina fly (enlarged). The body has a hairy covering. Eggs are laid on the body of the host. 4—Ichneumonid fly, which preys on the codling moth—it is one of the larger forms of insect parasites. 5—The syrphid fly, often mistaken for the honey bee. The larvae of this insect feed heavily on soft-bodied insects

Jose scale, black scale, mealy bugs, oyster shell scale, and many of the other scale pests.

The adult of the Vedalia beetle is about one-fourth inch in length and oval in shape. The color pattern is of red and black. This beetle feeds entirely upon the eggs and young of the cottony cushion scale. When the citrus industry in California was threatened by the latter, the Vedalia was imported and saved the industry from destruction.

Just recently a new lady-bird introduction has been announced in California, known technically as *Euxochomus nigromaculatus*. This insect was

tive to plant life. At a casual glance the average grower would class them as lady-bird beetles. This is often the case and the pests are allowed to go unchecked. However, all growers should be able to tell the lady-bird beetle from the Chrysomelid or leaf beetle. The antennae or feelers of the lady-bird are generally very short and are enlarged at the end. The leaf beetle antenna is rather long and is not enlarged. Also, the legs of the true lady-bird end with three small joints. The legs of the leaf beetles end in four small joints. These differences may be easily seen with the naked eye.

## Syrphid Flies

Another class of beneficial insects consists of syrphid flies. These are also referred to as flower, sweet, or honey flies. They are usually found where aphids are present. The adult of most of the syrphid flies is dark, with transverse yellow bands across the abdomen, not unlike some bees; in fact, syrphids are often mistaken for bees. The adult itself does not do any feeding on other insects, but the larva or worm of the insect does the feeding which assists in keeping down the number of plant lice. Most of the larvae are green in color, with a longitudinal stripe on the back. The shape and habits of the larvae are typical for all the beneficial forms. The body is slender and triangular in shape, there being no apparent head present. However, if closely observed it will be noticed that the head is located at the small end of the body.

It is interesting to watch a syrphid larva in search for food. It supports itself by the large end and then raises the front end up and swings it around. If it comes in contact with a plant louse, it lifts it into the air and sucks it dry. Thus ends the life of many aphids.

Nature has invested the syrphid fly with such a life history that the female adult when ready for egg laying seeks a colony of aphids and there deposits its eggs. This facilitates the control of the aphid very greatly, for it is unnecessary for the larvae to move around any great distance in quest of food.

## Lace-Wing Flies

Another group of insects which are predacious on aphids is that made up of lace-wing flies. These valuable insects take their name from the membranous wings with lace-like veins. There are two important groups of this insect: the green lace-wing and the brown lace-wing; the former is the most important.

At first glance one would say that these flies are very frail and delicate. To a certain extent, this is true, but, nevertheless, they are among our best insect predators.

The wings and body of the green lace-wing are, as the name implies, green in color, a yellow stripe running along the back. This yellow stripe distinguishes this fly from all other lace-wing flies. The eggs are white and oblong and are found at the ends of fine stalks, or threads, about one-half inch in length. This manner of egg laying is typical only of the green lace-wing. These stalks are generally found on plants where the adult has been feeding. The object of laying eggs in this manner is to prevent the first hatched larvae from destroying the remaining eggs. Another work of nature which must be marveled at. These eggs are generally noticed during the winter months, the first hatching beginning with the coming of warm weather. The larvae are spindle-shaped, covered with bristles, and have long sickle-like jaws. It is the larval stage of the insect which does the good work of feeding on other insects. They consume large numbers of plant lice, mealy bugs, and young scales, as well as the larvae of many lady-bird beetles. Here is a case where one beneficial insect feeds in part on another beneficial insect. However, the insect does more good than harm. The lace-wing in turn is also preyed upon by other insects. Thus, we see that there is no distinct line separating the beneficial from the injurious characteristics of the lace-wing fly.

The other beneficial group of this class of insects is the brown lace-wing. This insect is about the same in shape and appearance as the green lace-wing with the exception that the color is brown and the wings are not as delicate. Unlike the green lace-wing, the brown lace-wing fly does not place its eggs on a stalk, but lays them flat on

(Continued on page 18)



# Blackberry Varieties

By George M. Darrow

United States Department of Agriculture

**L**AST month thornless blackberries, the color of blackberries, the differences between blackberries and raspberries and between blackberries and dewberries, and the hybrids between each of these groups were discussed. Attention was called to the fact that since the forests have been cleared away the original species of blackberries were enabled to grow side by side and were hybridizing freely.

## European Varieties

In Europe, the fields have been cleared for centuries. As a consequence, European species of blackberries and dewberries have crossed and recrossed and thousands of different forms have been described. From this great number of wild forms few have ever been put under cultivation. All varieties that have been introduced into this country from Europe have been semi-trailing sorts and are evidently blackberry-dewberry hybrids.

Two of these semi-trailing introductions have become leading varieties in certain regions of this country. These are the Evergreen (also called "Oregon Evergreen" and "Black Diamond") and the Himalaya. Because both of these sorts, by reason of their great vigor, productiveness, and lateness of season, are attracting much attention in certain eastern sections, they are discussed in detail here.

The Evergreen, though thought by many to be native to the Pacific Northwest where it has escaped to the fields and roadsides, was known in England in 1809, years before the settlement of Oregon and Washington. Though originating, and even reported as occurring in the wild in England, it is of little importance there or elsewhere, except in restricted sections of the United States. It was first grown extensively in the Puyallup Valley in the Puget Sound region of Washington but now is an important crop in Oregon also. In New Jersey, it was first raised by George Liepe, who grew it from seed secured from England. Not knowing that it was identical with the Evergreen and came true from seed, he named it "Black Diamond."

The Himalaya variety, though introduced in California in 1897, appears to be identical with the Theodor Reimers blackberry which originated with the Theodor Reimers in Germany about 1889. It certainly belongs to the European group of blackberries rather than to any form found in the Himalaya region of Asia. The Himalaya is commonly grown in the home gardens of the Pacific Coast states and is an important sort for the local market in California. During recent

**T**HIS is the second and concluding installment of an article on Blackberry Varieties by George M. Darrow. Mr. Darrow is recognized as one of the foremost authorities on small fruits in the country. In these articles he has summarized the best known information on blackberry varieties, and he has presented much new information about the behavior in this country of varieties which have been imported from other countries.

years it has been coming into favor in the Southeast, especially in South Carolina, Georgia and Alabama, and in Arkansas.

No authentic hybrids of either the Himalaya or Evergreen are in the trade, though breeders are finding them promising as parents. In New Jersey, forms of the Evergreen with less finely divided leaves have been introduced under the names Pan American and Bushel. Such forms have appeared occasionally from seed of the Evergreen and are probably seed variations, not hybrids. The Macatawa, advertised as a hybrid between Himalaya and Eldorado, has proved to be the Crandall, a variety grown in southern California.

## New English Varieties

Three new English varieties of blackberries, Edward Langley, Sherlock and Pollock, with the same habit of growth as the Himalaya and Evergreen, have recently been introduced, but their possible value cannot yet be estimated.

The fruit of both the Himalaya and Evergreen is medium in size, of good dessert quality, large-seeded, and ripens in New Jersey in August and September, after most other blackberries are gone. The Himalaya ripens about 10 days before the Evergreen. The Himalaya is, however, soft and this character limits its value for the general market. The Evergreen, on the other hand, is the firmest of all blackberry varieties. In New Jersey, berries of the Evergreen which mature in the hottest part of the summer have sometimes been left on the vines a week after ripening and still have been firm enough for the general market. This characteristic of its fruit makes it of especial value for canning, and great quantities of it are used for this purpose in Oregon and Washington. Where they succeed, both the Himalaya and Evergreen are much more productive than any American sorts. The Evergreen,

though less vigorous, is the more productive of the two, yielding in the Pacific Northwest more bushels per acre than potatoes.

The Evergreen is grown extensively at present only in western Oregon and Washington and in New Jersey. Its culture is being extended rapidly in the latter state, and it is being thoroughly tested in Massachusetts, Maryland, North Carolina, Georgia and Tennessee. At least one profitable field is to be found in Maryland, and reports from Tennessee indicate that it may be of considerable value there. It has not been considered hardy north of New Jersey, while southward it has not been extensively grown because of its susceptibility to "double-blossom" disease. New Jersey growers have found that this disease can be readily controlled by picking off the diseased buds in early spring, and it is likely that the Evergreen will be grown extensively southward to Georgia and Alabama and westward to Arkansas, wherever growers will take the pains to control this disease. The Himalaya is not likely to be grown extensively in the Southeast because of its soft fruit. Its high quality and late season, however, make it valuable for the local market. It is probably less hardy than the Evergreen and should be tried only from Washington southward to Georgia, and westward to Arkansas.

The Evergreen in the Northwest should be set 12 feet apart in rows eight feet distant and trained to a wire trellis. In New Jersey, the plants should be set about eight feet apart and trained to a pole trellis or to stakes. The Himalaya should always be trained to a trellis. Unless carefully trained, neither variety is worth growing. When trained they well repay the labor.

## American Varieties

In the northeastern states especially the stock of American varieties of blackberries is badly mixed. Even

varieties themselves are confused. For example, the true Erie, an erect growing sort, can hardly be purchased from a nursery at the present time. In all, or nearly all, cases the Rathbun, a semi-trailing sort, is sold instead. Erie, however, under favorable conditions, is one of the most productive sorts, while Rathbun is decidedly unproductive. Again, the Eldorado is not popular in New York and New England, for the reason that a large proportion of the growers have been sold mixed plants or plants of some other variety instead of it. Often several varieties are to be found in a field when but one was ordered. Such mixtures have caused serious losses and have made blackberry growing unpopular with many. In the South, Southwest, and in the Pacific Coast states, varieties are not as badly confused.

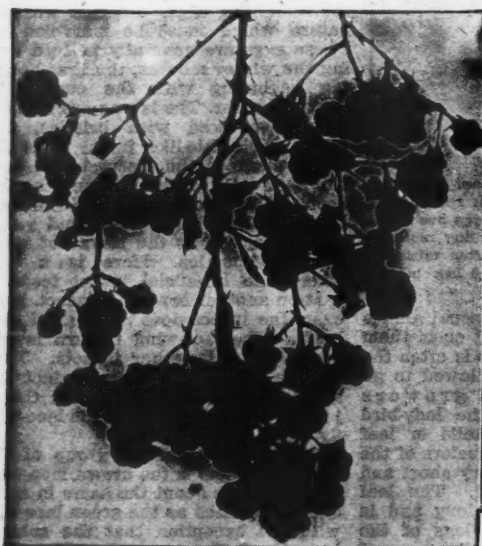
In general, the Eldorado, Snyder, Blowers, Joy, Ward and Mersereau are the varieties grown commercially in the North and East. In most of the South, the Early Harvest is the leading sort. In central Florida, the Florida Marvel is promising. In Texas, and to some extent in surrounding states, McDonald, Dallas, Haupt, and a variety supposed to be Lawton, are grown. In Oregon and Washington the Texas, and in California the Crandall and Mammoth, are the important sorts.

There are many other varieties of local importance and still others, new or little known, of promise for certain conditions. It is probable that the immediate future will see a great sifting out of the less valuable varieties and the emergence of some fine new sorts. Old varieties, such as Lawton and Kittatinny, should be retested. These are among the finest in desert quality and, when clean stock true to name can be secured, are well worth cultivating. New varieties of merit should be compared with those which have been so profitable in the past.

## New Varieties

Of the new sorts the Florida Marvel has within a few years become prominent in Florida where other sorts have not succeeded. This variety was found at New Smyrna near Daytona, and was first cultivated and introduced there. It was again brought to notice at St. Petersburg about two years ago and is now being listed throughout Florida. It is semi-trailing, resembling the Haupt in many respects, and is probably a blackberry-dewberry hybrid. As grown in Florida, the Florida Marvel is more nearly free from leaf spot than the Haupt. At Washington, D. C., it is not hardy, while Haupt is nearly or quite hardy.

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Left—Fruit cluster of the Himalaya blackberry. This variety is a standard for the home garden and market in California and is now being grown in South Carolina, Georgia, Alabama and Arkansas. Center—A single vine of the Himalaya, trained to a trellis, which produced nine gallons of fruit in its first year of bearing. Right—A small cluster of Evergreen blackberries, known as Black Diamond in New Jersey. It is the most productive and firmest of all blackberries. It is promising in Maryland and south to Georgia and west to Arkansas, and it is the leading variety in Oregon and Washington.



# Use of Tractors in Fruit Growing

By Arnold P. Yerkes

THESE is probably no other type of agricultural endeavor which lends itself so well to the effective and economical employment of mechanical power as does fruit growing. Most orchards and vineyards demand a large amount of power for cultivation during certain limited periods, when it is highly important that the work be pushed as rapidly as possible. Then there will be considerable periods when no power whatever is needed.

It is under just such conditions that mechanical power is particularly valuable, for it can be used 24 hours per day week after week, if necessary, and when the need for power is over, it costs nothing for care or maintenance, except a cheap shelter.

## Tractor Has Many Uses

Then, too, the modern tractor will not only furnish the power necessary for cultivating the orchard, but will also pull the spraying outfit (and at the same time furnish an abundance of steady power to drive the mechanism of the sprayer, doing away with the extra investment in a separate power plant for the sprayer and the trouble and expense of operating same).

And many orchardists also find the belt power of the tractor a valuable feature, since it saves investing in a separate engine to operate fruit presses, dryers, etc.

It is not surprising, therefore, in view of the all-round usefulness of the tractor in fruit growing that such a large percentage of orchardists have adopted it. In some sections the fruit growing business is almost 100 per cent motorized. A professor of the University of California recently stated that there were over 300 farmers (mostly fruit and nut growers) receiving mail from a single post office in California who used tractors.

While such complete motorization is

unusual enough to warrant comment, there are few fruit growing sections where tractors are not being used to some extent, and in ever increasing numbers. It is probably safe to make the statement that most fruit growers who are not already using tractors are contemplating doing so in the near future.

## Cheaper to Adapt Equipment to the Tractor

It is easier and often cheaper and more satisfactory to adapt orchards and orchard equipment to the tractor somewhat rather than to design a tractor to meet all the requirements of each individual orchard.

For example, it has been found that it is not essential that an orchard tractor should be able to creep along

under the overhanging limbs regardless of how close they may be to the ground. It is entirely possible to have the tractor travel near the middle of the row and still work the ground close to the trees, and it is much easier to design plows, disks, and other implements which will travel under the low limbs than it is to design a tractor to do so.

Nor is it absolutely necessary that a tractor be able to turn in a single row or even from one row into the next. While very short turning is often a convenience, it is by no means a necessity, as, by the exercise of a little ingenuity by the operator, all the work of cultivating, spraying, hauling, etc., can be done very satisfactorily by always turning into the second or third row when turning, in

very much the same way as many farmers turn when cultivating. Probably the designing of special tillage machines for orchard work has had more to do with making the tractor meet orchard needs than has the changing of tractor design.

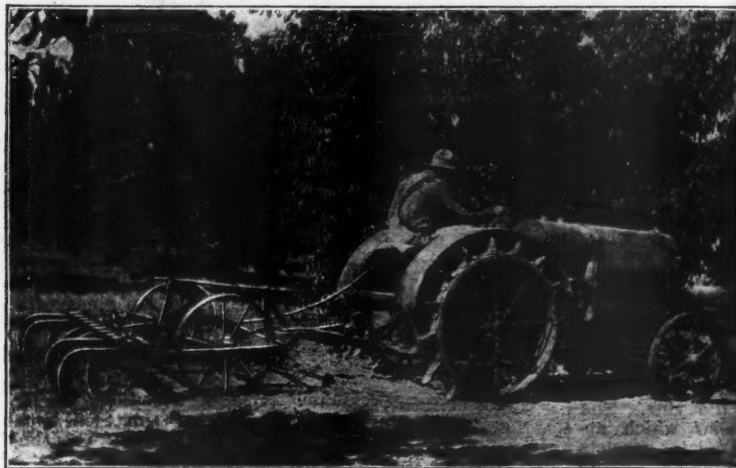
In fact, many orchardists have found that it is more economical and satisfactory to adapt their conditions so as to use standard farm tractor models with only slight modifications, such as the addition of shields and guards and the use of special lugs, etc., than it is to have specially designed tractors which cost considerably more and which are not likely to be as highly developed or as well serviced because they are used in smaller numbers.

## Proper Service Is Important

The matter of proper service on an orchard tractor is of supreme importance, for the quality of the service rendered by the manufacturer and his local representative determines to a great extent the value and general satisfaction of the outfit. The present-day tractor is exceptionally reliable and break-downs are infrequent, but with any machine there is always the possibility of a break from wear or accident. Proper service, however, minimizes the delay and expense of any such breaks, hence its importance. If repair parts are always available close at hand, even serious breaks need not delay the work more than a few hours. This is one of the big advantages of a properly serviced tractor over animal power—animals are just as much subject to disability, if not more so, but are not susceptible of such quick repair.

Furthermore, animals cannot be put to work at full capacity and for long hours after a period of idleness—to do so would be almost sure to cause their disability. With proper care,

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Pulling a five-foot chiseled tooth cultivator

# The Value of Birds in Fruit Growing

By Sada V. Blair

"You call them thieves and pillagers; but know

They are the winged wardens of your farms,  
Who from the cornfields drive the insidious foe,  
And from your harvests keep a hundred harms."

THOSE who consider only the monetary value of the cherries and other small fruits devoured by a robin are not going to acknowledge the economic value of any fruit-eating bird unless it be as pot-pie filler. They make a rapid calculation of the number of cherries required to fill the robins in evidence, and out comes the old shotgun.

There is a law, you say, against killing songbirds and so, of course, there aren't any killed. The law that doesn't prevent a man from killing his brother will scarcely stay his hand against a robin who's been caught robbing.

But is it robbery? Does a fruit grower welcome his hired men with a volley of bird shot when they come in from work in response to the dinner bell? He does not, and why? Because they are his helpers and without them his fruit would never reach a market. So when the fruit grower understands the value of the birds, he is going to give them as hospitable a welcome as he does his human helpers. At least, he'll hang up the old shotgun.

## Birds Prefer Wild Fruits

Turn to Farmers' Bulletin No. 630 of the United States Department of Agriculture, and read: "Much has been written about the delicate discrimination of birds for choice fruit and their selection of only the finest and costliest varieties. This is con-

trary to observed facts. Birds, unlike human beings, seem to prefer fruit that, like the mulberry, is sweetly insipid, or that, like the chokecherry or holly, has some astringent or bitter quality. . . . Where wild fruit is not abundant, a few fruit-bearing shrubs and vines judiciously planted will serve for ornament and provide food for the birds. The Russian Mulberry is a vigorous grower and a profuse bearer, ripening at the same time as the cherry. So far as observation has gone, most birds seem to prefer its fruit to any other. It is believed that a number of mulberry trees planted around the garden or orchard would fully protect the more valuable fruit."

The fruit grower who doesn't care to have his employees at the family table, sets a second table, where they may satisfy their hunger. He does not seat them at his own table and then berate them for being there; yet having made no provision for his feathered helpers, he grumbles when they vary a heavy meat diet with a few of his choice berries.

As is often the case, he is the victim of his own short-sightedness. He has cleaned out the wild shrubs that grew in the fence corners; the berries that once were common along the roadsides have disappeared; not strange then that the birds have come boldly up to the first table—to the cultivated fruits—for the owner has thoughtlessly cleared off the birds' table. If he is wise, he will set it again, and for two reasons. The first and least important is that by this measure he can harvest his fruit himself instead of having the birds do it. But the second, and stronger reason, is that by

such inducement as wild fruit planting he will be attracting more and more birds to his plantation, there to wreak havoc not upon his fruit but upon pests which are more destructive than an entire army of birds could be.

## Laborers Should Be Fed

And now the point has been reached where those who must be shown, arise and demand the proof. They are willing to grant that the laborer is worthy of his hire, if he labors—but who ever saw a robin or a catbird do anything but eat? And since that is the case, why bother to feed them?

As a matter of fact the more birds a fruit grower can persuade to live on and about his place, the safer his little horticultural corner is going to be from the attacks of predatory insects. Here seems to be a case, then, where eating and work are synonymous, and in order to prove any bird's value to his employer, it is only necessary to study his daily bill-of-fare.

To the ordinary untrained observer it would be no easy task to follow a husky bird through its daily food program from early dawn to dusk with scarcely a pause for breath, nor would such proof be more than circumstantial in most cases. As a rule one can only guess the character of what is being devoured by even a closely watched bird, for its movements are so swift that one has no time in which to determine whether the insect going down to certain doom is a pest or a protection to crops.

Statistics are pretty dry reading for the most of us, but whenever we are about to employ a new helper we like

to know that he has references from people whose judgment can be relied upon.

Suppose, then, we turn to the laboratory records of such birds as are most likely to offer their services this coming season.

## The Robin

Here comes the robin. What is his record to date? From 42 to 50 per cent animal matter—grasshoppers, beetles, caterpillars, spiders, snails, and angleworms. Taking it the year around, more than one-third of the robin's food is made up of insect pests, from 50 to 58 per cent vegetable food, of which over 42 per cent is wild fruit, the remainder consisting partly of cultivated varieties. Here must be where the cherries and strawberries come in. But there is a statement with regard to that: "While the robin takes some cultivated fruits, it must be remembered that, being a natural enemy of the insect world, it has been working during the whole season to make that crop a possibility, and when the fruit ripens, the robin already has a standing account with the farmer for services rendered, with the credits up to this time entirely on his side." Remember that this again is no sentimental or aesthetic valuation of the robin's services to you, Mr. Fruit Grower; it is the scientific estimate placed upon him by government investigators, as recorded in Farmers' Bulletin 630.

To keep him about your orchard and yet harmless to your early cherries, try planting a few Russian mulberries, which ripen at the same time as the cherries. And to supplement his insect diet, which probably needs a little variation from time to time, see that your ornamental shrubbery includes

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# Black Rot and Mildews of the Vine

By E. F. Guba

New York State College of Agriculture

**T**HE DISEASES of the vine known as black rot and mildews are in many sections of the country the most serious troubles with which the grape growers must contend. Wet seasons favor the development of these diseases, consequently annual losses vary from year to year. The diseases may be readily controlled by the application of the most practicable measures, but their successful control may be augmented greatly by a knowledge of the nature of these diseases and the conditions under which they develop.

## Black Rot

The name black rot applies to the condition of the diseased grapes, but all green parts of the vine may be affected. The usual course of development is for the berries to become entirely rotted, following which they become hard and shriveled in the form of mummies. The diseased leaves exhibit reddish-brown circular spots, which often run together to form large, irregular, dead areas. Black rot spots on the shoots, tendrils, fruit stalks, leaf stalks, and leaf veins appear as small dark depressions or cankers. On the shoots the spots rarely extend more than a quarter of the distance around, but the tendrils and leaf stalks may be nearly or entirely girdled. Numerous black dots or pimples, the reproductive organs of the fungus, appear on the surface of the diseased parts. On the leaf spots they are arranged more or less definitely in rings, like target markings.

The disease appears anew each spring, originating from diseased canes, tendrils, leaf stalks, or mummified fruits infected the year previous. The fungus grows in the leaves, berries, and tendrils of the vine from one to three weeks before any external evidence of the disease is seen. Shortly after the disease becomes evident, the fungus produces the black pimple-like structures mentioned above, which contain the spores that spread the disease throughout the growing season.

## Downy Mildew

Downy mildew is very generally known in the United States. It is more destructive to European varieties than to domestic forms. The disease also occurs on wild grapes and five-leaved ivy.

All young or green portions of the vine, as well as berries, may be destroyed. The nature of the losses for which this disease is responsible are: (1) shelling, rotting, and mummification of the fruit; (2) spotting of the foliage, in severe cases resulting in

premature falling of the leaves; and (3) sometimes a dwarfing and killing of canes and leaves.

On the leaves the disease is recognized at first as indefinite greenish-yellow spots, the margins of which shade off into the darker green of the normal leaf. The entire diseased portion becomes brown, dry and brittle and eventually cracked. The lower surface of the diseased areas of the leaf is covered with a downy white growth—the mildew. The canes, leaf stalks, and tendrils are subject to attack, and, as on the leaves, become covered with the coarse downy mildew. In severe cases the cane is dwarfed and the leaves remain small. On the fruit the first sign of disease is a hardening of the berry, together with a change from its normal color to a grayish-blue lead color. The berries wither, turn brown or red, and finally shrivel into mummies covered with mildew.

Downy mildew is caused by a fungus which passes the winter in the fallen diseased leaves. In the spring, while the leaves are rotting on the ground, the fungus becomes active. Heavy rains spread the fungus by splashing the spores onto the growing portions of the vine. The mildew which appears later consists essentially of the spores which serve to spread the disease further. In the fall diseased leaves fall to the ground, carrying the fungus within them. The fungus is capable of doing most injury during prolonged moist, warm weather. Heavy rains of short duration, followed by sunshine and winds, are not favorable to the spread of the disease, while on the other hand, long dry periods do not kill the fungus, although such conditions help to check it.

## Powdery Mildew

Powdery mildew is an entirely different disease than downy mildew, although the effect of the disease on the fruit and on the vine is much the same, and the same control measures apply.

All parts of the vine are affected. The leaves show a mottled appearance, and the diseased patches run together until a large portion of the leaf is covered with a powdery, grayish-white mildew. Sometimes the diseased leaves are malformed and discolored. A vine with diseased foliage has a wilted and dwarfed appearance, especially early in the season and in warm, dry weather. An affected vine also has a moldy odor. On the shoots the diseased portions acquire a very evident grayish tint. In mild attacks the mildew is confined to patches, while in severe cases whole canes are covered. Affected canes turn dark and fail to mature properly. Diseased young berries are dwarfed and are caused to drop. If the berries become infected later in their growth, brown patches appear which are covered with mildew. These berries then grow irregularly and crack or become dwarfed in size and reduced in quality. The fruits are not attacked after they enter the ripening period. Fruit stalks and leaf stalks may also be badly mildewed and by harvest time the stalks are dwarfed

and withered. The powdery mildew, like the downy mildew, consists largely of spores which are readily carried by the wind and which spread the disease during the growing season. Toward the end of the season, small, black, pimple-like structures appear on all of the mildewed parts of the vine. These are largely responsible for carrying the fungus over the winter.

Infection of the new growth occurs early in the season and continues to spread until October. The growth of the fungus is favored by rains, fogs, and warm weather in spring and early summer.

## Environmental Conditions Influence the Development of Black Rot and Mildew

Both black rot and the mildews develop under conditions favorable to the retention of moisture on the vines. These conditions are obtained:

1. In low spots and along streams in the vineyard.
2. Where plowing and cultivation are neglected.
3. On vines with dense and abundant foliage.
4. Where the vineyard is partly shaded by timber or sheltered from the winds, especially on the south side.

## Control

Keeping in mind the conditions influencing the development of black rot and mildew, control involves first of all the removal of such conditions insofar as practicable.

Plowing and cultivation are very important. These practices not only keep down the weeds which are so favorable for the retention of moisture on the vines, but plowing early in the spring before any growth has started also destroys the sources of the fungus in the over-wintering diseased leaves and mummified berries on the ground.

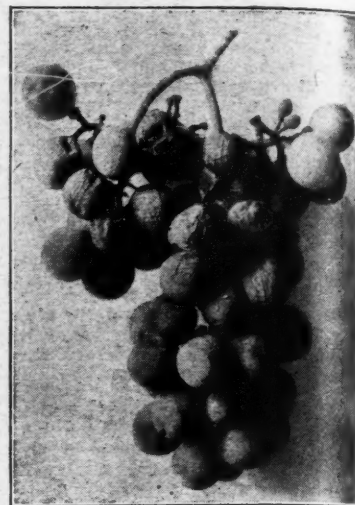
All commercial vineyardists practice pruning, and it may suffice to state that this practice helps to remove the excessive shading of the foliage and to open the vines to free air circulation.

The black rot fungus over-winters partly in diseased canes, clingers, and tendrils. By pruning and destroying these diseased parts of the vine, a large source of the black rot is eradicated before the new growth begins.

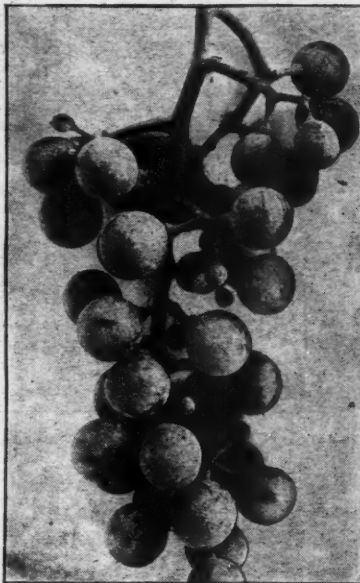
Where black rot and mildew are prevalent, spraying will prove very effective in conjunction with the practices already suggested. Bordeaux mixture 3-4-50 should be used, but when the hydrated lime is substituted for the rock lime, five pounds of the hydrated lime should be used. The applications should be made at the following intervals:

1. When the second or third leaf is showing.
2. Just before the blossoms open.
3. As soon as the berries set.
4. Two weeks later.
5. When the berries first touch in the clusters.

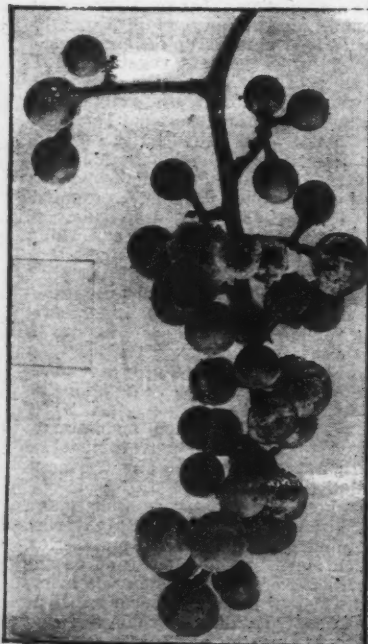
The character of the weather during the growing season has a great influence upon the development of these diseases. It is the most important



Grapes affected with black rot



Powdery mildew causes brown patches, covered with mildew, to form on the grapes



Characteristic appearance of downy mildew

factor that determines the number of applications necessary for their effective control. The first three applications in the above schedule are very essential where these diseases are feared. The remaining applications may be omitted under relatively dry weather conditions and where early infections have been successfully prevented by the early sprays.

In selecting a site for a vineyard, avoid low spots, locations along streams and along stretches of timber. These situations not only lack good air circulation, but they favor the retention of moist conditions which are so essential for the development of these diseases.

## Mistakes In Orchardng

**A**N ARTICLE by C. E. Thorne in the *Monthly Bulletin* of the Ohio Agricultural Experiment Station gives some valuable information obtained from an orchard planted by the experiment station in 1906 and 1907. Such information can be turned to good advantage by growers now planting orchards.

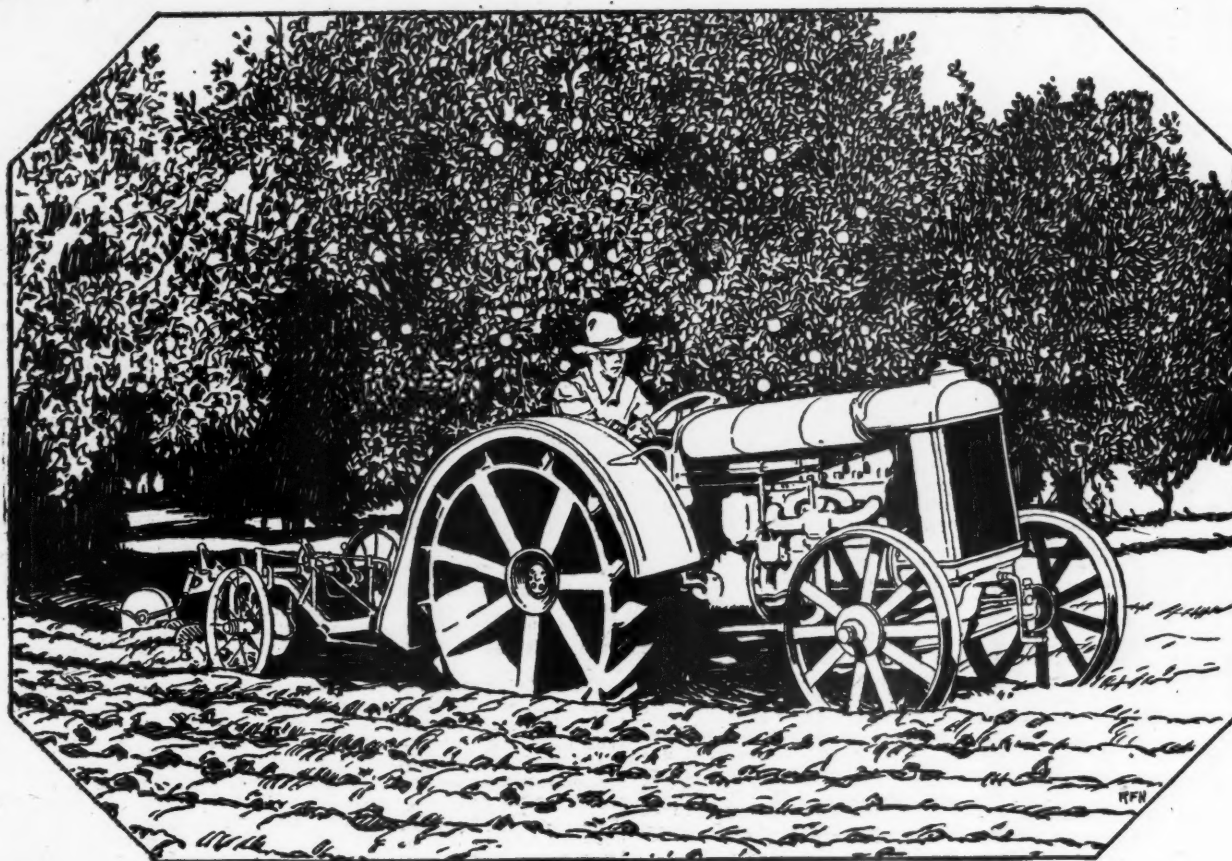
At the time of planting, Grimes was considered an excellent variety for Ohio conditions. The results have substantiated this view. Rome Beauty, while not planted to a large extent in this orchard, has since proved itself equally as valuable as Grimes, and superior to Baldwin and Jonathan for Ohio conditions.

The permanent trees were set 36 by 40 feet. On half the land, Elberta and Champion peaches were used as fillers and on the other half Gano apples were used. The peaches gave good results and produced several profitable crops before any apples of consequence were harvested. But the peaches were short lived and died of old age before the apples needed all the room. The Gano apples grew and bore well but proved undesirable because of their inferior quality. It seems now that it would have been better to have planted one apple in the middle of each square as a semi-permanent and two peaches as fillers for each permanent apple. Under this arrangement there would have been, after the peaches were removed, 500 more apple trees on the 20 acres, which would have borne five or six years longer without injuring the permanent trees or interfering with spraying.

Orchard grass was used in part of the orchard and has given good results. Alfalfa was planted in part of the orchard and some of it is still present. It appears that a good stand of alfalfa would have been an asset to the orchard.

The trees were headed low and this has proved advantageous. More than half the fruit can be picked from the ground, and the shading of the ground conserves moisture.





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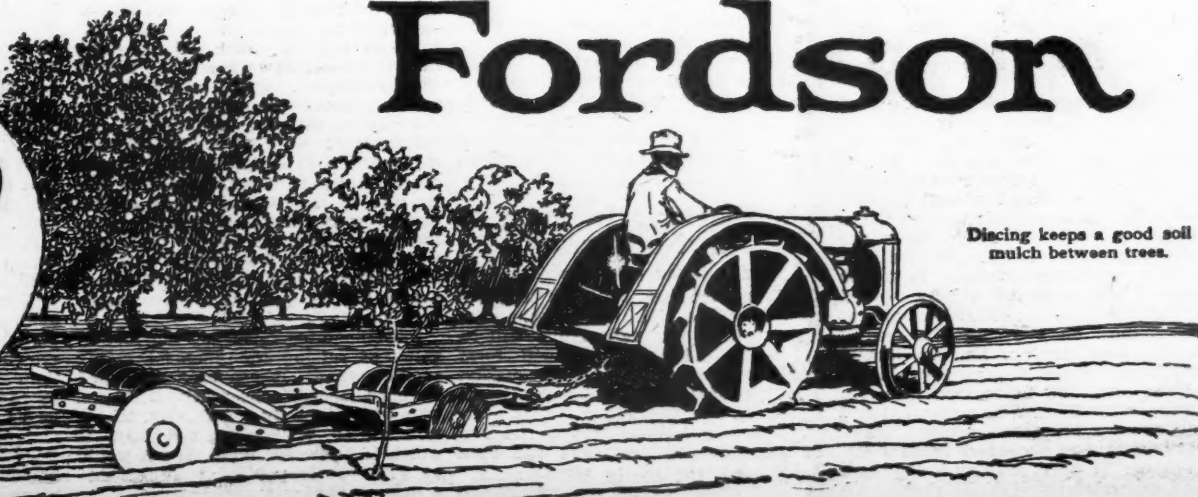
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## The Value of Birds in Fruit Growing

(Continued from page 11)

such berry-bearing bushes as the various elders, sumacs, dogwoods, Juneberries, etc. Even the berries of the Virginia creeper are eaten with avidity. I have seen at one and the same time, three robins, several brown thrashers, a mocking bird and two flickers enjoying a dessert of Virginia creeper berries on the garage roof. This didn't mean that any one of them was neglecting his bug-slaughtering duties. They were simply whetting up an appetite for more.

### The Bluebird

As to the bluebird's record, the fruit grower needn't waste any time in consulting it, for more than 75 per cent of the food taken throughout the year is animal matter and the remainder almost solely wild varieties, such as pokeberry, bittersweet, Virginia creeper, sumac, ragweed, rose haws, etc. They prefer grasshoppers and caterpillars, beetles and millipeds. This is a list hard to improve upon.

Catbirds and brown thrashers, house wrens, kingbirds and cuckoos, jays and blackbirds are birds most likely to be among those present when the fruit grower calls the roll.

Like the bluebird, the wren brings the highest of references as to his desirability as an employee. He lets his employer's fruit strictly alone and devotes himself to such noxious pests as grasshoppers and beetles, gipsy moths and cutworms, to say nothing of all the other kinds that he uses as filler.

### Catbirds and Brown Thrashers

Catbirds and brown thrashers need a little explanation. Their references come with a confidential note at the bottom of the page. Here is one such: "Although the catbird sometimes does considerable harm by destroying small fruit, it cannot on the whole be considered injurious. On the contrary, in most parts of the country it does far more good than harm."

Once again is the reminder: "Cultivated fruits can be protected by the simple expedient of planting wild species which are preferred by the birds. Some experiments with catbirds in captivity show that the Russian mulberry is preferred to any cultivated fruit."

Taking into account the number of May beetles, grasshoppers, caterpillars, bugs and spiders which these two birds devour every day, the fruit toll sinks into a negligible item, being entirely overbalanced by the destruction of injurious pests.

### The Kingbird and the Cuckoo

Beekeepers have complained that kingbirds fail to distinguish between noxious insects and honey bees, and with this complaint in mind an investigation was made which, like many investigations, exonerated the kingbird. It was found that 665 kingbirds had eaten a total of 61 honeybees, 51 of which were drones—so the kingbirds showed discrimination and no great fondness for hive bees after all. There is no charge laid against them by fruit growers, and the proportion of harmful insects devoured is very great.

One could fill a book with the good deeds of the cuckoo family. First of all, he is a 100 per cent insect destroyer, and perhaps that tells all that any fruit grower cares to know. But he ought to understand that the old notion that cuckoos turn over the infant industry to other birds for carrying on is no longer accepted. The nest is a sloppy affair at best, but after I had watched a yellow-billed cuckoo clean out an entire nest of tent caterpillars on a young elm tree, I would have forgiven him for almost anything. When Nature, for reasons of her own, saw fit to clothe certain of the caterpillars with a fur coat and spines as a protection against predatory birds, she reckoned without the cuckoos. To them no fuzz is too thick and no armor too spiny to prevent an

investigation of the food-possibilities within. Reports from the laboratory point out the fact that cuckoos show an apparent preference for just such upholstered tidbits as the caterpillar tribe offers. Farmers' Bulletin 630 furnishes interesting reading as to the contents of certain cuckoos' stomachs. Since the cuckoo is not at all a vegetarian, about all the inducement the fruit grower can offer him is an undisturbed and happy hunting ground.

### Sammy Jay

One who is in the position of employer soon becomes familiar with a certain type which, having no references, presents himself blusteringly, announcing that the world owes him a living anyway. Something like that is the jay's attitude. His reputation has suffered a trifle from various of his misdeeds, but he arrives with a dash and flurry, sending in his name in a truculent fashion that would be aggravating were it not amusing. Sammy Jay is nobody's fool, however, and in spite of his cruel tricks towards other birds, he really does a notable job of fall housecleaning on grasshoppers, hibernating insects and their eggs, and all kinds of forest insects. He is, therefore, an aid to man except as he destroys other bird life.

The blackbirds come with no cannibal stains upon their claws, but their habit of eating grain has brought them into ill-repute in purely agricultural circles. Even there, however, it has been found that while they are undoubtedly eating no small amount of grain, they are also taking care of the destinies of millions of grubworms, etc. This is also true of crows.

It is scarcely fair to make a list such as this and omit such valiant workers as the flicker, the woodpeckers, the phoebe, the orioles, etc., but one must stop somewhere, and to prolong the list would be but to repeat the tale of daily work well done.

### Make Surroundings Attractive for the Birds

Does the fruit grower need the birds in his business? It would seem so, and his cry for help should be expressed in terms of wild fruits and berry-producing shrubs, which will not only attract numberless birds about his home, but which will also add (as will the birds) a new element of beauty and interest to his family life.

A few bird houses or shelters and a bird bath, which need be nothing more than a shallow pan, judiciously placed, are an added inducement to the birds and furnish work for the children, who should be encouraged to take thought for the birds. The winter feeding of birds with suet and meaty bones and crumbs from the table may serve to keep about the place birds who will refrain from migrating if assured food throughout the cold months.

Get your children interested in the birds by taking an interest in them yourself—and don't let it rest entirely on their economic value. Great as it is, there is a greater value still and that is to be found by neighboring with them, by studying their characteristics, by learning their language, and by noting their beauty. Go out into the open spaces with the children and teach them the value of these feathered guardians of your crops. Tell them that the future of these little citizens rests in their hands, and for that responsibility see that you train them in your own lawns and orchards.

## The Blackcap Industry of the Northwest

(Continued from page 4)

short and too few buds are left, the crop is reduced. If the branches are left too long, too many fruits will be produced, and the vines will form small, seedy berries of poor quality. The vigor of the vine is also greatly depleted by over-production. This over-cropping may seriously reduce the crop of the following year, and has been known to even-kill the vines.

The training of the blackcap is the

most simple of any of the bramble fruits. Many growers simply take out the canes and cut back the side branches, as described above. A better method, however, is to tie a hemp string around each bundle of canes in such a manner as to leave a sort of loose bouquet effect. This keeps the canes from tipping out and breaking down under heavy winds, and also keeps the vines out of the way of cultivation. Some growers believe that a low trellis, consisting of wires strung about 18 inches apart on cross arms about 18 inches above the ground, is a simpler and less costly method in the long run. The initial cost of such a system of training is greater than the tie-up method, but Sissal hemp runs into money when used every year for tying up the vines.

The second pruning should come some time in May as a rule, when the young canes have reached 24 to 30 inches in height. These young canes should then be cut back to about 18 to 20 inches high. This causes a low, sturdy branching. When this cutting back is done early in the season, strong buds will be formed on the side branches, but when the cutting is made too late, small side branches with weak buds will be formed and little fruit will be borne the following season.

The third pruning will come any time from shortly after harvest until late fall. In this pruning, the old vines that have just fruited should be cut out and should be piled in alternate spaces between the rows. The disposal of the old canes is something of a problem. Many growers draw them out on a wagon. Others pull them out by a rope arrangement. One of the best methods ever used by the writer has been to burn them in a sheet-iron burner mounted on runners and elevated enough to avoid burning the young plants. In the writer's experience, he took the brush burner that he had used in an apple orchard and simply put a false pair of runners and bracing under it. If one is constructing a burner, he should make ample provision for a good draft by cutting two or three openings in the bottom and having some openings along the sides. The team should be protected by having a sheet-iron front piece or dash-board. The accompanying illustration shows the operation of this piece of equipment.

(This article will be concluded in the June issue)

## When It's Painting Time

By G. T. K. Norton

WITH the advent of clear weather, after the spring thaws have dried out, comes the logical time to start the outside painting on a farm. At this season the whole job can be quickly completed, since the work can be steadily carried through without delays due to bad weather.

In the spring, too, the farm is likely to need paint. Now is the time to repair what damage winter storms may have wrought; to make rot-and-rust-proof all exposed surfaces, for the blistering sun of summer is an enemy to property. It is only by covering surfaces with a protective film of paint that the destructive forces of nature can be checked. Once started, the inroads proceed steadily, eating away the capital invested in property; repair bills follow. The annual property depreciation is estimated at 7.25 per cent. Statistics show, moreover, that the life of a building will be lengthened from two to four times by repairing every third or fourth year, and with the present high prices of building materials and cost of labor, it is preferable to build one barn rather than four.

A well-painted farm has the further value of raising the financial rating of the owner. It has been estimated by hard-headed, conservative bankers, who will take only a safe risk, that a well-painted, well-maintained farm is worth 16.2 per cent more than it would be with poorly painted buildings and a down-at-the-heels appearance.

Another argument for brightening up the farm with springtime is found in the renewed life and activity in the animal kingdom, particularly among those less desirable members—vermin, insects and other pests, which at this season are replenishing their race. Eggs, larvae and pupae of such unwelcome creatures are destroyed by paint, while the adults will not remain in the proximity of fresh paint. There is a sanitary need for spring painting.

To make it possible for the farmer to pay for the expense of painting, even though he may have a lump sum available at the time, the Save the Surface Campaign, representing the paint and varnish industries, has perfected a plan whereby the cost may be met easily by a series of payments. An initial payment of one-fifth of the estimated cost is made to the painter, and the rest is paid off in 10 monthly installments. Two large credit companies are financing the plan, which is endorsed by members of the paint and varnish trade throughout the country. It is possible now for the expense to be met comfortably; and even though a loan has already been taken out, this additional credit may be arranged.

Many farmers and fruit growers have so many buildings that it is a big job to keep them painted; in fact, the bigness and expense of the job has no doubt been responsible in large part for the neglect of painting of farm buildings. The paint spraying machines offer an effective means of handling this problem.

It is true that a paint spraying outfit is somewhat costly for an individual grower. But the spirit of co-operation is developing rapidly among farmers for the buying of supplies and the marketing of products, and there is no reason why this plan cannot be used in connection with paint spraying outfits, the same as it is used in connection with the community ownership of threshing machines, spraying outfits, fumigation apparatus, stud horses, etc. In many cases the spray ring plan of ownership will be found effective. Under this plan one man owns and operates the machine and makes a certain uniform charge for material and labor. No doubt in many cases the proposition could be handled through the co-operative buying or selling organization, the same as "spraying is done in California. With 12,000 co-operatives in the United States, having a membership of 500,000, it ought to be a simple matter to extend the co-operative idea to the ownership and use of paint spraying outfits. Under such a plan, farm buildings could be painted oftener and more cheaply, and their life could be greatly extended.

Springtime means painting time—and with the new installment plan for meeting the cost, and the economic, co-operative method of sharing the expense, every farmer has an opportunity to increase the value of his property by 16.2 per cent; of checking an annual property depreciation of 7.25 per cent, and of making his farm a more sanitary and pleasant place in which to live.

IN AN effort to develop a plan for encouraging better business practices in the sale of nursery stock, the New Jersey Farm Bureau, in co-operation with fruit interests, called a conference of growers and nurserymen at Trenton on March 24. The object of the meeting was to discuss methods used in the sale of trees to the end that a code of practice between growers and nurserymen might be developed.

H. E. Taylor, Secretary of the New Jersey Farm Bureau Federation, issued the following statement:

"Assurance to the grower of high quality nursery stock will do more perhaps to develop the now rapidly growing fruit industry in New Jersey than any other one factor. High costs in the production of quality apples, peaches, pears and other tree fruits make it imperative that business practices in the sale of nursery stock be amended so as to eliminate unscrupulous and haphazard practices."





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## The Louisiana Strawberry Industry

(Continued from page 3)

boxes, one at a time, arranging them so that they present a good appearance.

Pickers are paid about one and one-half cents a pint, which makes the charge for picking about 30 cents for a 24-pint crate. The usual amount paid the packers per crate is around 12 cents. The crates cost from 20 to 25 cents each, including boxes. It can thus be seen that the cost of field handling is between 62 to 70 cents a crate. Some 24-quart crates are used, but growers prefer the pint crate, which is an exact replica of the standard ventilated quart container, except that it is smaller.

### How Louisiana Berries Are Marketed

Field gathering and handling is usually finished by noon, and then the berries are taken to the railroad loading stations and placed in express refrigerator cars. Practically all Louisiana berries move by express instead of by fast freight. After the season opens up well, "Berry Specials" pull out of Hammond every evening soon after six o'clock.

Practically all of the growers finance their crops through the co-operative strawberry associations, which sell them plants, fertilizer and crates, and attend to the marketing of the crop. The associations do not sell directly to the northern buyers, but turn their berries over to one of three auction companies that conduct auctions in Hammond every evening between seven and eight o'clock. The buyers from the leading markets and produce houses throughout the North and East are present. They have run up and down the two railroad lines during the day, examining the cars as they were being loaded the morning before so that they will know how to bid wisely. As a certain car is called and des-

berries, or which are not well packed, are classed as seconds. This rigid inspection has done much to improve the quality of the fruit and is reflected in better prices to the farmers.

The average number of acres of strawberries per grower in the Tangipahoa district is three acres, the average yield is 90 crates per acre, and the average price during the season of 1924 was \$3 per crate. Recalling the cost per crate for field handling, and counting in from \$10 to \$20 an acre for fertilizer, and including cost of plants and labor items, it can be seen that berry growing is not in the bonanza class. Growers who follow the business from year to year and give it intelligent study and who really work, do realize reasonable profits.

The industry has expanded to such a degree that a modern fruit and truck experimental station, under state supervision, has been established at Hammond. This farm is in charge of an expert horticulturist, and experiments and demonstrations in fruit and vegetable culture are made, which are of great value in building up the industry.

## Factors in Successful Plum Culture

(Continued from page 8)

order named, Mariana, the peach, Americana, and seedlings of Domestica plums.

### Sterility in Plums

Some plums do not set fruit even though the trees blossom abundantly. The chief cause of infertility seems to be the impotency of the pollen on the pistils of the same variety. The remedy for such self-sterility is to plant in close proximity varieties that will cross pollinate. Another cause of self-sterility is defective sexual organs in a few varieties. Varieties seem to



View in a packing shed adjoining one of the strawberry plantations in Louisiana

cribed well enough to be identified, they bid on it, and it is knocked down to the highest bidder.

The auction company collects from the buyer, and, after deducting a charge of five cents a crate for the service of selling, turns the proceeds over to the association concerned, which association usually gives its grower members their checks the day after the cars begin rolling for the markets, provided the growers do not owe the association for financing. The auction system is now in its third year, and seems to be working better than the former method, under which the different associations sold their loadings outright to the buyers.

All shipments are now made under state inspection. Every crate of berries is opened by state inspectors at the loading stations. Two grades are generally maintained, a No. 1 and a No. 2, or seconds. The very best berries go into the No. 1 grade. Crates that contain green, over-ripe or faulty

have sexual affinities and sorts to be planted together must be chosen rather carefully. In making a choice, also, it must be certain that kinds planted together for cross pollination bloom at the same time.

### Culture

Plums are far too often set too close. The distance should depend upon the soil and the variety. A rod or 18 feet is the proper distance in most parts of eastern America for all excepting the very wide-spreading sorts. These distances would be too close were it not best to cut down the trees when the orchard begins to decline, which in most localities is at the age of from 20 to 30 years. In eastern America, plum trees are usually set two years from the bud; in the South and Far West, one-year-old trees are the rule. In eastern America plum trees should be headed low with the head composed of from four to five main branches, and a central leader for the



for May, 1925

Domestic, Damsons and natives; a vase-shaped tree is better for most of the Japanese sorts. Japanese plums, especially Burbank and Abundance, do best when heavily pruned; other sorts require comparatively little pruning.

In common with all tree fruits, plums do best under tillage. Tillage consists in plowing in the spring, followed by frequent cultivation until August, at which time a cover crop of clover, oats or barley, cowhorn turnips or a combination of some of these should be planted. The plum requires a little more water than other tree fruits, and cultivation and cover crops are necessary to give sufficient moisture. Despite the fact that plums want a rich soil, probably most of the fertilizers used for this fruit are wasted. The writer speaks, however, from experiments on rather heavy soils where it is certain that all fertilizers applied to plums are wasted. On light, sandy soils, it is probable that nitrogen at least would benefit both tree and fruit. Thinning the crop should be a regular practice in growing the Domestic and Japanese sorts. The Damsons need no thinning.

### Blackberry Varieties

(Continued from page 10)

In Maryland one of the finest varieties for home use is the Nanticoke, a very thorny, erect-growing sort. It belongs to the "sand blackberry" group which is native from Cape Cod southward along the sandy Coastal Plain to Florida and west to Texas. Its season is about with the Evergreen, beginning after other varieties have finished ripening their fruit. The berries are deliciously sweet and of good size but not very firm. It should be widely tested throughout the eastern states from New Jersey westward to southern Missouri and south to the Gulf. In Texas the Eureka, another "sand" blackberry, is advertised and may fill the place of Nanticoke there.

There are several little known varieties that merit attention and should be widely tested. The Queen, a semi-trailing variety from Texas should be tested where Haupt and Dallas are grown. Hopkins, an erect growing Texas sort, and Georgia Mammoth, grown about Atlanta, Ga., should be tested in the milder sections from Maryland to Arkansas. A new variety from New York, Green Hardy (Green's New Hardy), is also promising for more northern regions.

### Blackberries Through a Long Season

In New Jersey, where the Lucretia dewberry and Evergreen (Black Diamond) are raised commercially, growers may cover a long season by a proper selection of varieties. There the Lucretia may be used for early, Joy or Ward for mid-season, and the Evergreen for late. These three varieties should furnish commercial pickings for over two months and will enable one to furnish steady work for pickers and regular supplies to the market.

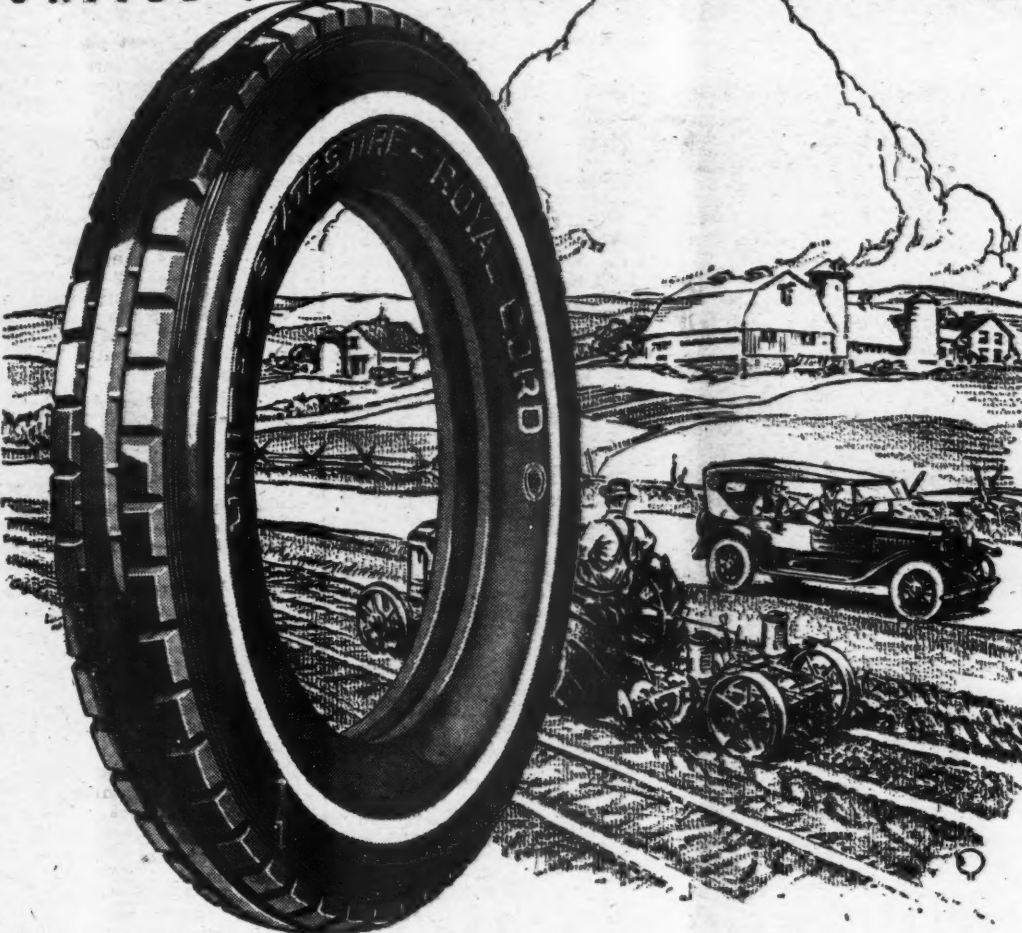
A similar combination can be used in Maryland and in portions of the states southward to Georgia and westward to Arkansas. The Young dewberry is a promising new sort and may replace the Lucretia in this succession in places. Likewise, the Eldorado may surpass the Joy and be substituted for it in Tennessee.

In Texas the Mayes or Austin Thornless dewberry or the McDonald or Haupt may be followed by Lawton.

In southern California the Crandall followed by Himalaya will give fruit for a long season. In late summer, a second crop can be secured from the Crandall. In central California, the Mammoth or Cory and Himalaya, and in Oregon and Washington, the Mammoth, Texas and Evergreen, will furnish pickings for about two months.

The northern and northeastern states cannot have as long a blackberry season, for the Evergreen is not considered hardy north of New Jersey. Wherever the Lucretia dewberry is hardy, however, a fairly long season, extending through the usual dewberry and blackberry seasons, is possible by following it with the Eldorado.

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### Brown Rot of Cherries and Plums

**BROWN** rot is present every year in northwestern prune and sweet cherry orchards, although it does not every year do serious damage. It does damage in two forms—by infecting the blossoms and by rotting the fruit.

The nature and control of the disease are discussed in Farmers' Bulletin 1410, recently issued. Plowing and harrowing around the trees early in the spring are advised. Such treatment buries many mummified fruits and disturbs the spore-producing processes. Orchards free from mummified fruits and in which early plowing

and harrowing has been practiced, have shown much less damage from blossom infection and fruit rot than other orchards.

Application of a fungicidal spray should be made just after the blossoms open, again just after the blossoms are shed, and a third time from three to five weeks before picking time. Fruit from sprayed orchards has shown much less brown rot than from other orchards. Even in seasons when brown rot was practically absent in the orchards, sprayed fruit reached distant markets in far better condition than unsprayed fruit.

A copy of Farmers' Bulletin 1410 can be obtained from the United States Department of Agriculture at Washington, D. C.

**TESTS** conducted at the New Jersey Experiment Station indicate that plants can take nitrogen from solution in the form of ammonium as well as in the form of nitrate. For many years it has been held that plants could absorb nitrogen only in the form of nitrate. In the New Jersey tests the plants seemed to show no preference for either form, and both materials were absorbed from solution at the same time. There were some indications that ammonia was absorbed at a higher rate than nitrates in the early stages of development. This result was not surprising in view of the fact that ammonium sulphate has been giving apparently as quick results as nitrate of soda in orchards during the past few years.



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## BRIGHT LIGHTS ON THE FARM

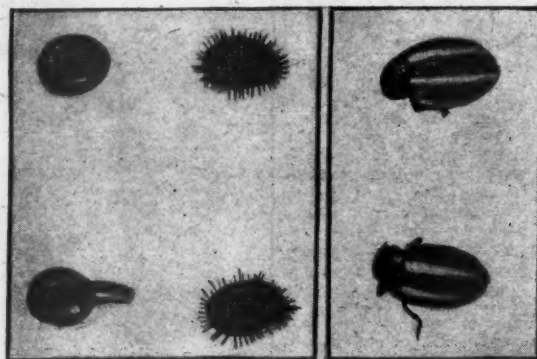
great majority of all the individual electric light and power plants in rural homes get their current from Exide Batteries. Exides are made for every purpose by the largest storage battery manufacturers in the world.

## Friends of the Fruit Grower

(Continued from page 9)

the leaves, generally the underside. The larvae are not blotched with numerous spots as is the case with the green lace-wing. Like the latter, the brown lace-wing feeds on soft-bodied

if not of greater importance than, the predaceous forms. These are the parasitic insects, most of which are classed with the Order Hymenoptera. Nearly all of these are minute in size and live parasitically within the host. Practically all of the female Hymenopterous parasites have long egg tubes



Left—Adults and pupal cases of two-spotted ladybird beetle, a heavy feeder on mealy bugs and several scale insects. Right—Adults of striped ladybird beetle. Note the smallness of feelers—this is characteristic of practically all beneficial ladybird beetles

insects. The green lace-wing is more effective in controlling soft-bodied insects than the brown lace-wing. This can possibly be accounted for in California by the fact that so many of the brown lace-wing flies are destroyed in the pupal stage by an insect parasite, thus keeping the number of adults maturing very low.

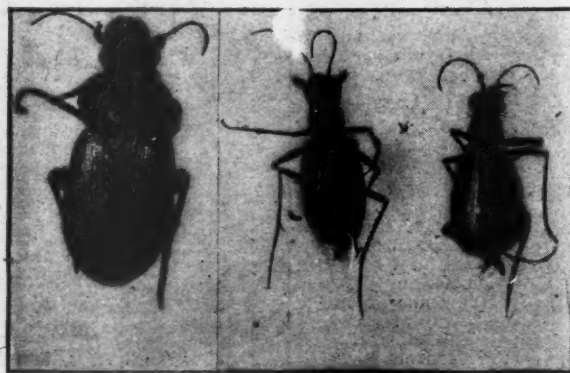
## Ground Beetles

The ground beetles form another group of beneficial insects, taking their name from the fact that they spend most of their life underground or in hidden places. They are generally found under old logs, fallen fence posts or fallen branches under a tree. They are usually black in color and vary in size from one-quarter to one and one-half inches in length. Both young and adults feed upon caterpillars, especially cut worms and army worms. Any caterpillar insect which spends part of its life history in or on the ground is subject to attack by ground beetles.

One of the most important beetles of this class in California is the Black Calosoma. This beetle averages about

which they make good use of in depositing their eggs. The skin of some unsuspecting caterpillar is punctured with this egg tube and the eggs deposited within the body of the host. These eggs hatch into the maggots which begin to feed upon the juices and tissues of the caterpillar. The caterpillar generally reaches the cocoon or resting stage, but instead of a beautiful moth or butterfly appearing in the spring from the cocoon, a large number of these parasites make their exit from the dried skin. Parasitized cocoons are generally identified by the large number of small exit holes of the parasite. All Hymenopterous parasites do not behave in the above manner, but instead of depositing the eggs within the caterpillar, some species deposit their eggs on the host or within the egg of the host. In the latter case the parasite receives its nourishment from the egg.

There are many forms of Hymenopterous parasites which are doing splendid work along lines of pest control. However, only a few representative members will be discussed briefly.



Tiger beetles (enlarged). These beetles prey on insects that live on or under the ground. By means of heavy saw-like teeth, they hold and chew their prey

an inch in length, making its appearance in early spring. The insect possesses strong jaws with which it tears its prey, principally cut worms and army worms, to pieces.

The Murky Ground Beetle is well known to most eastern fruit growers. The larvae of this beetle feed on the larvae of the plum curculio, which they secure from fallen fruit containing the destructive curculio.

All of the insects mentioned above are termed "predaceous, beneficial insects," or insects which attack their prey from the outside. There are many other forms of these valuable insects but space does not permit going into any detail regarding them. Suffice it to say that some of these are the tiger beetles, wasps, lightning bugs, soldier bugs, assassin bugs, etc.

## Parasitic Insects

There is another class of beneficial insect that is of equal importance as,

One of the most important parasites of the codling moth is the *Icheumonid* or codling moth parasite. This parasite is one of the larger forms of the Hymenopterous parasites. The codling moth is attacked when in the cocoon. The female parasite lays a single egg, within the cocoon and as soon as the maggot hatches begins feeding upon the tissues and sap of the codling moth. And thus end many potential codling moth adults. This parasite has not become established in sufficient numbers to keep the codling moth under perfect control, but nevertheless it must be given credit for the work it does.

## Aphids and Scale Parasites

There are several forms of aphid parasites. These work within the body of the aphid and when mature make their exit through a small hole which they cut in the body of the

(Concluded on page 31)



## Peach Thinning and Peach Profits

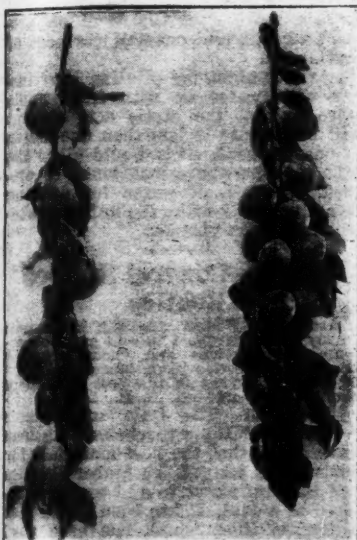
(Continued from page 5)

moved, a second thinning may be made.

Most inexperienced thinners pull, yank or twist the fruit off, thus injuring the twigs. Varieties differ in their ease of separation from the twigs. Some may be twisted off without injuring the wood, but the best method of removing them is to grasp the peach with the thumb and the second finger, and place the first finger just above where the peach unites with the wood, and by pressing in a quick, snappy manner, the peach snaps off, separating easily from the stem without being injured in the least. This is both the most rapid and the best way of removing the fruit.

### Cost of Thinning

The excuse generally given for not thinning is that the operation is laborious and expensive. This is a case, however, where a little extra money invested will add greatly to the in-



The branch on the left was thinned; that on the right was unthinned

come of the orchard. The cost of the operation is variable, depending upon the amount of fruit, the size of the trees, the quality of the labor, and the season. Some growers do not regard the operation as extra expense, but consider it as early harvesting. All of the fruit must be eventually gathered. It is easier and cheaper to thin the small fruit in early summer than to pick it at harvest time and have to spend this time in the rush of the harvest season. Peaches from trees that have been properly thinned are so much easier to sort and pack, that the expense of thinning is more than saved.

The time that it takes to thin an average mature peach tree with a full crop varies from 10 minutes to half an hour, depending upon conditions. It requires a good class of labor to perform the work. This will give the grower an idea of what it will cost him to thin; however, he can determine more accurately the cost of the operation by timing the work on a few trees.

### Advantages of Thinning

The chief advantages of thinning are:

1. Thinning enables the tree to produce the largest possible weight of fruit with the least expenditure of energy.
2. It tends to distribute the weight more evenly over the tree, so that the danger of breaking the limbs is reduced to a minimum.
3. It enables the tree to produce vigorous growth and strong fruit buds.
4. It permits better and more thorough spraying.
5. It results in the production of more crates of peaches of a better size and quality.

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6. It causes the fruit to ripen more evenly.

7. It produces fruit that is more uniform in size and easier to grade.

8. It prevents the excessive weakening of the tree. The development of the pits is an exhaustive process, but by reducing the number of pits produced, the tree is not so much weakened.

## Cultivating Young Apple Trees in Alfalfa Sod

By C. L. Burkholder  
Purdue University

MANY orchards are planted on soil which has been used for general farm crops for so long that it is de-

pleted of its natural supply of organic matter. While the orchard is young the soil can be built up at a small expense by means of a leguminous crop, such as alfalfa. Young apple trees during the first four or five years of their life need lots of cultivation to make the best growth. Coffing Brothers at Silverwood, Ind., are using a very successful method of culture in their young orchards, which are in alfalfa. A space around the trees eight feet in diameter is kept under constant cultivation by using a one horse spring tooth cultivator. The cultivator is either dragged between the trees on its side or rolled along on the wheel by raising the teeth just high enough to clear the ground. This method makes it possible to go both

ways through the orchard, hold a fine dust mulch around the trees, and at the same time conserve a maximum of the alfalfa plants. Strip cultivation tears up a lot of unnecessary ground and still leaves the ground uncultivated on two sides of the trees. The above method is also much more rapid than using a grub hoe and following this by raking the ground with a potato hook to keep down weeds and hold a dust mulch.

Two old fogies were watching an aeroplane flying high in the air.

Said one, "Gee, but I'd hate to be up there with that thing."

Said the other, "Yes, but I'd hate a whole lot more to be up there without it."



## Are Plant Lice and Pear Psylla Taking Your Profits?

They have done it before. Stop them! Cyanogas (Calcium Cyanide) used as a dust, will destroy Apple Aphid and Pear Psylla.

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## CALCIUM CYANIDE

is easily applied with a duster. Each particle of dust on coming in contact with air, generates gas which penetrates to every part of the tree and kills the insects instantly.

Your dealer has Cyanogas (Calcium Cyanide) or can get it for you. Or, we will send you a hundred pound drum of B Dust for eleven dollars f.o.b. Warners, N. J.

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 of Delaware  
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## Poison With A Peerless

Try Dust Insecticide for codling moths and curculio. Easy to apply and effective in its work. Use a **PEERLESS HAND DUSTER** and note how convenient it is. The gears are scientifically constructed to produce a maximum amount of power with minimum effort. Will distribute any insecticide in dust form. Feed can be regulated to any density required. Can be used on plants, bushes and trees with equal force.

Write for a circular and name of nearest dealer.

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## Aphis Insurance

In the Garden, Field and Orchard

Your Agricultural College or Experiment Station will tell you that to be protected against Aphis, Leaf Hopper and similar insects which cause dwarfed fruit and culls, you should use such a solution as "Black Leaf 40." Another advantage is that it can—and should—be used with sprays for scale, codling moth and other fruit tree enemies, thus making one spraying do double duty. "Black Leaf 40" costs only a few cents a tree. Ask your dealer for new Leaflets, or write to

**Tobacco By-Products & Chemical Corp., Louisville, Ky.**

**"Black Leaf 40"**  
 40% Nicotine

**Kills Aphis**

## The Editor's Mail Box

### Selection of Apple Varieties for Cross Pollination

AMERICAN FRUIT GROWER MAGAZINE: Where can I get a list of varieties that are good pollinizers for each other?—J. K. W., Ohio.

ANSWER: The question of fertile and sterile varieties of apples is far from being solved. Some varieties are self-fertile one year but partially or wholly self-sterile another year. The climate and location appear to exercise considerable influence on fertility and sterility. The same variety is sometimes self-fertile in one location and partly or wholly self-sterile in another location during the same season. The same variety varies in its fertility from year to year in a given location.

For these reasons it is impossible for anyone to make a list showing definitely the behavior of the different varieties as to sterility and fertility. In some years two varieties interplanted with each other will bloom at the same time, but in other years one of them may bloom earlier than the other. In the latter case, pollination is usually not so good as in the former case.

The best that anyone can do in the matter is to make up lists of varieties which give good results with each other under average conditions. The question is to a large extent a local one, and no one can prepare a list that will apply to fruit sections in general. The best way for you to handle this problem is to discuss the matter with growers in your community and secure from them as much information as possible regarding varieties which appear to do well when interplanted with each other. I would suggest also that you write to your state horticultural society and to your agricultural experiment station and get their advice as to the best combination of apple varieties to use in your locality.

### How to Apply Rock Phosphate

AMERICAN FRUIT GROWER MAGAZINE: I have purchased a ton of rock phosphate to put on my five-acre vineyard this spring. Please advise me as to the best method of spreading this. Not having had any experience with rock phosphate, I am at a loss to know just how to proceed.—P. M. L., Illinois.

ANSWER: In many soils, rock phosphate has not been found advantageous for fruits. However, in the opinion of many growers, it is an advantage to apply rock phosphate to fruit land as well as to general farm land.

I suggest that you apply the rock phosphate with a fertilizer drill or limestone spreader. You will probably find a fertilizer drill best in your vineyard. There are narrow drills made which can be used easily between the rows in a vineyard. Possibly there is some truck grower in your vicinity from whom you can borrow a fertilizer drill adapted to your needs.

I suggest that for the first application you use about one ton of rock phosphate per acre. If you have not used phosphorus before, the chances are that your land will be more or less deficient in this element, and it is for this reason that you should use a larger quantity for the first application. After this, 400 or 500 pounds, applied once every three or four years, will provide sufficient phosphorus to meet plant needs and gradually increase the phosphorus content of your soil.

### "Stuck" Vinegar

AMERICAN FRUIT GROWER MAGAZINE: I have vinegar which is not strong. I put the cider in old vinegar barrels. It will not turn to strong vinegar. Will molasses help it added to it? Will brown sugar be of any advantage? What other methods of procedure can you suggest?—A. S., North Carolina.

ANSWER: The making of vinegar is dependent upon two sets of reactions. First, the sugars in the sweet

cider are changed to alcohol by yeasts, and then the alcohol is changed to acetic acid by bacteria.

In making vinegar, the best results are obtained when the first reaction is practically complete before the second reaction begins. Sometimes in practice the second reaction begins before the first reaction is entirely over. The presence of a small amount of acetic acid will stop the first reaction.

It is possible, therefore, that in your case the second reaction started before the first reaction was complete and that you have so much acetic acid in your vinegar that the first reaction cannot be completed.

I would suggest that you try one of the following methods:

1. Keep the vinegar in a warm place, about 80 to 85 degrees Fahrenheit, for a while. This may help to complete the necessary reactions.
2. Another method would be to blend your weak vinegar with stronger vinegar, so that the final product will contain more than the legal requirement of four and one-half per cent of acetic acid.
3. You might try diluting the vinegar with water or with fresh apple juice so that the acetic acid content will be reduced to less than one-fourth of one per cent. This would allow the first reaction above mentioned to proceed. The use of water for diluting would probably make the finished product useless as vinegar.

### How to Control Striped Beetles

AMERICAN FRUIT GROWER MAGAZINE: In my home garden I like to grow cantaloupes, watermelons and cucumbers, but the striped beetles have caused me a lot of trouble. What is the best method of controlling them?—R. B. K., Iowa.

ANSWER: The Ohio and Illinois agricultural experiment stations have found that the best materials for controlling striped cucumber beetles are calcium arsenate and gypsum, applied as a dust. It has been found that air-slaked lime, which has been used extensively in past years, tends to stunt the plants. Gypsum does not have this disadvantage.

Calcium arsenate can be obtained from drug stores or firms which handle spray materials. Gypsum or land plaster can be obtained from lumber yards as a rule. If you cannot get pure gypsum, use the burned product, which is prepared for building purposes and

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which usually contains some fiber. Sift out the fiber. Mix one pound of calcium arsenate with 20 pounds of gypsum by sifting the materials several times through a screen or by rotating a barrel containing the two materials.

You should apply the mixture as soon as the young plants appear, or if you start the plants in frames, as soon as they are set in the open. Repeat the application after every rain or at intervals of about a week. In applying the mixture, use a dust gun, blower duster, or a home-made shaker. The latter can be made by nailing a handle to the side of a bucket or can, and by puncturing the bottom with holes punched from the outside in.

The Illinois station reports that a two per cent nicotine dust has given almost as good results as the above mixture.

### Water Sprouts on Pear Trees

AMERICAN FRUIT GROWER MAGAZINE: I have numerous early pear trees which send up numbers of sprouts from the roots for several yards around. Later varieties are full of them. What causes this and what can I do for it? Will these sprouts make good trees if transplanted?—S. L. R., Texas.

ANSWER: Some varieties of pear trees tend to send up sprouts in the way you describe. I think this tendency is greater in mature or old trees than in young ones. The tendency toward this condition is probably greater in rolling than on level land. The washing away of soil on the rolling land brings the roots near the surface and this tends to encourage the growing of sprouts. Sometimes, when an old orchard is disked or plowed, the roots are cut and this tends to cause them to produce water sprouts. When the tree trunks and main branches are badly diseased, there is also a tendency for the roots to send up water sprouts. I know of nothing you can do for the difficulty except to give your trees good care and cut off the water sprouts and force the growth into the trees.

Water sprouts that come out from the roots rarely produce fruit of the same variety as the tree. Such sprouts usually come out below the bud or graft. In this case their fruit will partake of the characteristics of the root on which the scion or bud was worked. The only thoroughly dependable way to get new trees like that of your parent variety is by budding or grafting propagating wood from the tree on seedling roots.

### Currant Aphids

AMERICAN FRUIT GROWER MAGAZINE: Last year my currants were attacked by insects which I suppose were aphids. I did not notice the insects until most of the damage was done. They worked on the under side of the leaves and caused the leaves to pucker and swell. What can I do to prevent such damage this year?—R. L. W., Pennsylvania.

ANSWER: Your plants were in all probability attacked by aphids. They work on the under surfaces of the leaves and cause the leaves to pucker and swell. The aphids hatch early in the spring and often the first evidence of their presence is the abnormal swelling of the leaves.

In treating this insect, you should watch your plants closely. The aphids do not do serious damage every year. When you see that the aphids are present, you should spray immediately, taking care to do so before the leaves become distorted. Use nicotine sulphate three-fourths pint to 100 gallons of water. Apply with high pressure to the under surfaces of the leaves. You must actually hit the insects with the material in order to kill them.

### Combating Apple Borers

AMERICAN FRUIT GROWER MAGAZINE: Apple borers do a lot of damage every year in our section. Please write me the best method of handling them.—R. F. U., Massachusetts.

ANSWER: I presume you refer to the round-headed apple borer. Unfortunately, paradichlorobenzene as used for peach borers cannot be used successfully for apple borers.

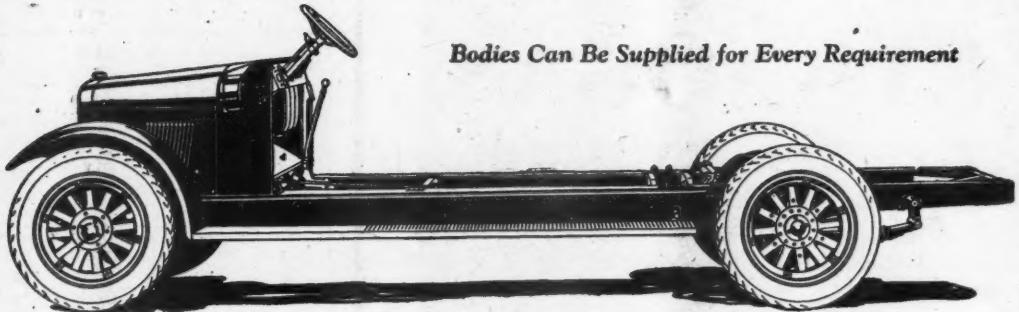
Paper or screen wrappers applied

about May 1 will prevent the females from laying their eggs. Washes have been used with fair success in many instances to repel the beetles. One of the best is thick whale oil or caustic soft soap solution to which crude carbolic acid is added at the rate of one pint to 10 gallons of soap solution. This should be painted on the trunks thickly from about May 1 to 15, when the female moths are flying and are depositing their eggs. The wash repels the moths and forces them to lay their eggs elsewhere.

Despite these precautions, some borers will get into your trees. Every fall and spring you should go over the trees with a sharp knife and a small piece of wire and hunt out the borers. The larvae remain in the trees two years as a rule. If you reach the borers soon after they hatch, they will be in the sap wood and easy to find, but if they are deep in the wood, they cannot be found easily and you will damage the trees more or less. Badly damaged trees can often be saved by bridge grafting. All wounds should be covered with white lead paint.

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and unloaded easily. A capacity load (2000-lb. maximum) of fruit or produce can be hauled without piling to an inconvenient height. The low construction and low load weight assures safety and easy driving at all road speeds.

Regular equipment includes heavy pneumatic truck cord tires, power tire pump, front fenders, electric self starter, electric lights, storage battery, electric horn and tools. See the local dealer or write to us for complete information.

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The International line includes a Speed Truck for 2000-lb. loads; Heavy-Duty Trucks ranging from 3000 to 10,000-lb., maximum capacities; and Motor Coaches for all requirements.

### Parasites for Gipsy Moth

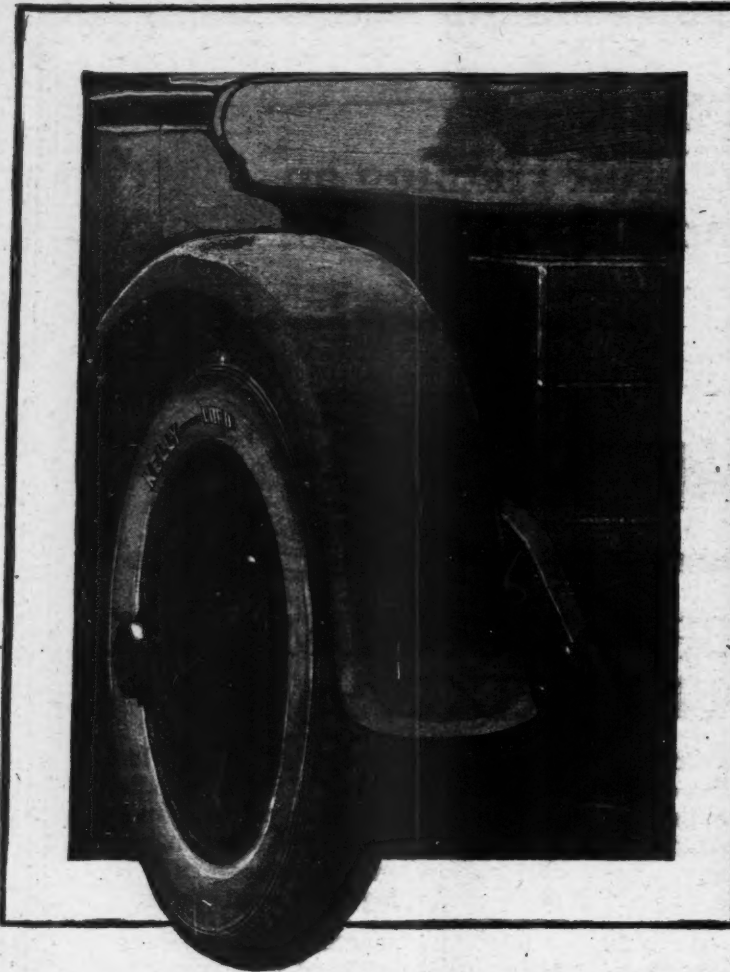
Question. How effective at the present time are the parasites and other natural enemies imported for the control of the gipsy moth?

ANSWER: It is very difficult to answer this question definitely for the reason that a number of other factors besides parasites and natural enemies are causing a reduction in the density of gipsy-moth infestation. Extremely low temperature in the winter and scarcity of favored food plants are very important in some localities in the infested region. Several species of parasites and natural enemies that have been imported have been constantly increasing for several years, and in the forest regions of New England, particularly in the territory that has been longest infested, there has been a marked decrease in the density of infestation during the last two seasons. This has been caused largely by the work of parasites and natural enemies. This does not mean that the infestation has been cleaned out completely, but

it has been reduced in many sections to such an extent that no complete defoliation of trees has resulted. It is difficult to predict what the future will be. It seems probable that in some sections certain species of parasites have reached their maximum. Whether a sufficient number will remain to prevent further increase of the gipsy moth cannot be predicted. If the number of parasites decreases, heavy outbreaks of the gipsy moth will result within the next few years. —Official Record.

CHARLES L. ROBINSON, state supervisor of horticulture of Washington, recently made the claim that Washington would again lead in apple production in 1925. He pointed out that 10 or 20 years ago the average production of apples in Washington was less than 10,000 cars per year, while in 1923 the state produced more than 37,000 cars, and in 1924 more than 25,000 cars, notwithstanding the serious damage from late spring frosts.





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**T**HE Kelly Flexible Cord is the best tire Kelly-Springfield has ever built. This statement is meant to be taken literally and not as a mere advertising catch phrase. For the new Kelly Cord will exceed even the record of its predecessors by many miles of unbroken, silent service.

The construction of the Kelly Flexible Cord is different from that of any other tire. The bead is built in as an integral part of the carcass, making a stronger and yet less rigid construction, which also makes possible the use of a flexible tread.

The Kelly Flexible Cord is sturdier than the former Kelly Cord and at the same time is more pliable. To the car owner this means a combination of mileage and easy riding that hitherto never has been equaled, either by our own tires, or so far as we know, by any others.

# KELLY

## Flexible Cord



**T**HE ANNUAL report of the American Telephone and Telegraph Company shows that that organization has a total of 345,446 stockholders. It may seem out of place to mention this matter in a fruit magazine, but there are several points in this connection which are of interest from a co-operative viewpoint.

In the old days, business corporations were usually controlled by a few persons, and these exercised care to keep control within their power. This viewpoint still prevails in many corporations, but many of the larger corporations, particularly public utilities, railroads and others, have gotten away from this idea. Under the old plan there was a lack of confidence on the part of the public in corporations and there were frequent government and state investigations. Under the new plan large numbers of people are involved, greater confidence prevails, and there is less government interference.

The American Telephone and Telegraph Company is a good example of the corporation which has encouraged large numbers of people to share in its ownership. Such a plan of operation has many of the earmarks of a co-operative association. The stockholders are co-operating with their investments in developing a big business. The principal difference between such a corporation and a co-operative is the basis of interest. In a business organization, money is the basis. Each stockholder shares in the profits and in the voting in proportion to his investments, allowing, of course, for different kinds of stock. In a co-operative, the products handled are the basis of interest and each member participates in the returns in proportion to the volume of products furnished by him. In some co-operatives the voting is also done according to volume of products, but in most of them the one-man-one-vote idea prevails.

There is also a point involved which is of interest in connection with contracts. A business corporation gives a man a stock certificate when he buys stock, and this constitutes a contract. The contract, however, usually says nothing about the return of the money if the investor is not satisfied. In other words, the contract is a perpetual one from the standpoint of the company so far as the use of the money is concerned. The owner of the stock cannot get his money back from the company if he is dissatisfied. His only recourse is to sell the stock to someone else. Thus the company is assured of practically perpetual use of the money, which is the basis of interest.

In connection with co-operative marketing we hear much argument, pro and con, about contracts. Some persons believe long-time contracts are necessary in order to enable an association to overcome early obstacles and to establish itself on a sound basis. Others want short-lived contracts that can be terminated easily. When we compare the co-operative contracts with the stock certificates of business corporations, we see that the longest-time co-operative contracts are at best mild affairs in comparison with the severity of contracts covering stock ownership in business corporations.

There is much that co-operatives can learn from large, successful business corporations. The directors and members should study their methods

of organization and operation to the greatest extent possible. Such a study will help put the co-operative movement on a firmer foundation.

**I**N A RECENT issue we gave an account of the different funds established by the Yakima Fruit Growers' Union in their refinancing plans. The plan provides for two additional features, which were described in the March issue of the *Big "Y" Bulletin*. These features provide for accumulation of liquid capital to facilitate more economical operation and to provide the means for putting the preferred stock into a revolving fund.

A budget is to be worked out in advance for each season's operations. To provide this budget, a system of charges for marketing and buying service will be developed. While it is expected that the charges will be lower than the cost of such services elsewhere, it is expected that the association will be able to develop a surplus fund from this account. There is in the association treasury at present unissued preferred stock to the extent of \$75,000. Instead of returning the surplus in money, it is planned to return it in the form of preferred stock, on the basis of the amount of business done by each member through the association. Thus the association will retain in cash the full amount of the surplus. The association will purchase preferred stock now outstanding to the extent of half the money in the surplus fund, the other half being retained to increase the operating capital. The outstanding preferred stock will be purchased in the order of its serial numbers. Such stock will then be reissued to the active members in proportion to the business done by them through the association. Thus, the financing will be placed on the well known revolving plan. Under this plan all moneys retained for the revolving fund will in time be repaid in the order such money was received by the association, and furthermore, the financing will be furnished by growers actually making use of the association. This plan is a sound one in every respect.

**T**HE ANNUAL meeting of the Illinois Fruit Growers' Exchange was held at Centralia, Ill., on March 14. Thirty-five delegates from 10 member locals were present. A good spirit prevailed throughout the meeting, it is reported.

President I. D. Snedeker gave chief attention in his address to the arrangements made for sales service the coming season. Recently J. O. Lawrence, formerly of the Chicago office of the Federated Growers, was employed as sales manager. Under the new plan, the exchange will have the same personnel handling its sales throughout the season, and from season to season. Furthermore, the salesman, being employed by the exchange, will presumably take a keener interest in developing the affairs of the exchange. Again, all products will be sold in the name of the exchange and the money will be returned directly to the exchange, fees for distribution service then being advanced by the exchange.

The new plan should prove a distinct improvement over the old "flying squadron" plan under which two or three men were often sent to sell the products of an organization during a single season, and in which



there was no consistent policy looking toward the building up of the name and reputation of exchange products, and in which the products were sold in the name of another organization.

Mr. Snedeker also announced that the exchange would collect its own claims in the future, with the co-operation of the Illinois Agricultural Association. In the past claims have been handled by the Federated Growers. The exchange will continue to use the Federated brokerage service in the markets. Because of the fact that Federated service will be used to a smaller extent than formerly, the charges to be paid the Federated will be materially reduced.

A. B. Leeper, General Manager, stated that in his belief the exchange stands alone among members of the Federated in hiring its own sales manager and still retaining membership in the Federated.

Addresses were also given by R. L. Emery of the Centralia Chamber of Commerce, H. W. Day of the State Department of Agriculture, Dr. J. W. Lloyd of the University of Illinois, Ferdinand Kohl of Centralia, and F. A. Gougler of the Illinois Agricultural Association.

The by-laws as framed at the time of reorganization under the new law were adopted unanimously, with a slight amendment.

A resolution was passed requesting the state legislature to provide sufficient funds for continuation of the standardization and inspection service. It was also voted to extend thanks to the university, the Illinois Agricultural Association and county farm bureaus for support given the exchange during the past year.

Directors were elected as follows: W. L. Cope, L. O. Day, Willis Seward, Frank Lanter, J. A. Gage, N. W. Casper, L. N. Colp, H. O. Smith, and R. B. Endicott.

A directors' meeting followed the meeting of delegates, at which the former officers were re-elected, as follows: I. D. Snedeker, President; W. L. Cope, Vice-President; and W. L. Parks, Secretary-Treasurer.

**THE ANNUAL** meeting of the Michigan Fruit Growers, Inc., was held at Benton Harbor on March 27. Sixty-one delegates from the various locals were present. An excellent spirit prevailed throughout the meeting.

Chief attention was given during the meeting to the question of advertising and merchandising Michigan fruits. Addresses were given by B. H. Branch of Detroit on the municipal market in Detroit. James E. Sanford, C. M. Palmer, and Julian Armstrong of Chicago made excellent talks on the advertising and merchandising of Michigan fruits.

F. L. Granger of Benton Harbor, Sales Manager of the organization, presented a report in which he described the experiences of the past season and in which he made recommendations as to future policy and development. C. E. Durst of Chicago made a short talk on problems of directors and managers.

M. D. Buskirk of Paw Paw was re-elected president. Other officers elected were Amos Tucker, First Vice-President; Herbert Nassinger, Second Vice-President; and F. L. Bradford, Secretary-Treasurer.

**BOTH** houses of the Nebraska legislature have approved a co-operative marketing act, which is similar to the ones in effect in more than 30 states. If signed by the governor, this law will go into operation in June.

**"AS A MEANS** of bringing about more orderly production and marketing, I cannot over-emphasize the need for strong, efficiently managed, co-operative marketing associations:

"Co-operation is an effort to create a better system of marketing, to produce and market products that consumers demand, and to distribute these commodities with the least possible cost. Its most helpful feature comes from the education in business

which farmers obtain in their efforts to conduct co-operative associations efficiently.

"Indeed, the whole movement rests on the support given it by individual farmers."—W. M. Jardine, Secretary of Agriculture.

### Spray Rings Give Success

**COUNTY** agents and farm bureaus deserve great credit for promoting the production of more and better fruit among their members. They have by this means brought into productivity many orchards which have borne practically no fruit for years.

A recent report of the farm bureau of Clinton County, Ind., states that

two spray rings were organized in 1922, consisting of 12 farmers each. Small outfits were purchased and supplies were bought co-operatively. The men employed for the spraying followed instructions of the farm bureau office and Purdue University. The year's results were satisfactory. In 1923, four more rings were organized and success was again attained. In 1925, five more rings were organized, making 11 in all.

Each spray ring has 12 members. One kind of spray machine is used throughout. The company manufacturing this machine conducted a sprayer school in the spring of 1924. Through the spray rings, the use of nitrate and better orchard culture have been encouraged.

Great interest has been aroused among fruit growers and a fruit growers' association has been formed. This association is now buying the materials co-operatively for all of the spray rings. Three cars of materials were bought in 1924, including 17,000 pounds of nitrate of soda. A considerable quantity of fruit trees has also been bought by the association for its members. V. J. Mann is county agent of Clinton County.

### Nobody Home

Jakie: "Ikey, you should put the curtains down when you kiss your wife; I saw you last night."  
Ikey: "The chokes on you, Jakie; I wasn't home last night."

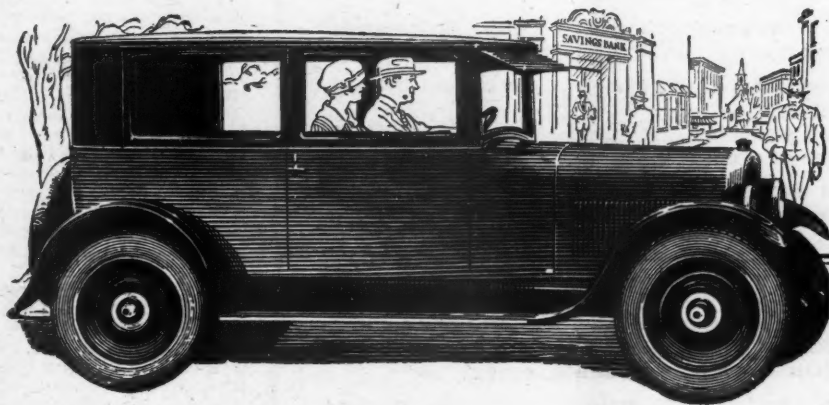
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Vital parts are 50% oversize, to counteract the toll which worn and unimproved roads strive to take.

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"The heartache and the thousand natural shocks

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## Markets and Marketing



THIRTY-FIVE million dollars was the estimated farm value of last year's crop of strawberries in 27 states, according to the United States Department of Agriculture. The acreage was slightly less than in 1923, but the total production reached 267,000,000 quarts, thereby breaking all records. Carlot shipments exceeded the highest previous mark, established in 1922.

The combined shipments from all the shipping states amounted to 18,780 cars, of which Tennessee furnished 2900 cars, Maryland 2150, North Carolina 2050, Virginia more than 1900, Louisiana, 1865, Arkansas 1600, Delaware 1300, and Missouri about 1000 cars. The shipments from Florida and some of the south central states were lighter than usual, while unusually heavy shipments were made from the coastal region extending from North Carolina to New Jersey. These states shipped 2000 cars more than in 1922. The total shipments of these five states amounted to 40 per cent of the entire 1924 output.

THE DEPARTMENT of Agriculture has predicted a good yield of early strawberries for 1925, notwithstanding the smaller area devoted to strawberries this year. The acreage is about nine per cent lighter than that of 1924. The big decreases are in the lower Mississippi Valley states, extending from Louisiana to Tennessee. A reduction of 23 per cent is reported in Tennessee, the leading strawberry state of the Middle West. Louisiana has an acreage 30 per cent lighter than in 1924, but Missouri reports an increase of almost 20 per cent. North Carolina and Virginia show a decrease of 15 per cent.

The first express carlot shipments moved from Louisiana on March 11, about two weeks earlier than in 1924. Local authorities are estimating that there will be shipped from 1500 to 1600 cars from that state in spite of the reduced acreage. Western markets received shipments from the Imperial Valley of California the last week in March. Florida had marketed 525 cars of berries to the middle of March, compared with 450 cars to the same date in 1924. Because of the light shipments, the prices in eastern markets have been rather high. This was particularly true of the berries from Florida.

THE BUREAU of Agricultural Economics has recently prepared a summary of the Kentucky-North Tennessee strawberry deal for 1924. G. D. Clark is the author. The summary shows that the Aroma is the leading variety of this section. Comparisons are made between the Kentucky-Tennessee crop and the Missouri crop. These crops are competitors in some of the markets. The daily and weekly shipments, as well as destinations and comparisons by years, are presented in tables. One table gives the carlot shipments of strawberries from important producing states during the past five years.

THE FEDERAL Horticultural Board recently decided that the principal fruits of Porto Rico, consisting of citrus fruits, pineapples, avocados and bananas, would henceforth be exempt from the requirement of permit and inspection as a condition for entry at mainland ports of the United States, but that provision must be made for

the inspection and certification of such fruits in Porto Rico at the point of production or shipment. The board will co-operate with the Porto Rican authorities in such inspection and certification.

The board also announced that it will co-operate with Porto Rican authorities in the enforcement of federal quarantines, the object of which is to prevent the entrance of dangerous foreign pests into the United States or its territories, particularly the Mediterranean fruit fly and the Mexican fruit fly.

OUR EXPORT trade in apples has been growing steadily since before the Civil War. During the years 1852 to 1856, an average of 37,000 barrels was exported annually. The shipments did not reach a million barrels a year until 1903, when 1,656,000 barrels were exported.

Most of the apples from the United States are shipped to the United Kingdom. In 1923, for instance, 75.8 per cent of the shipments went to the United Kingdom, 7.1 per cent to Canada, 3.3 per cent to Norway, and 13.8 per cent to all other countries.

Germany was the second largest importer of apples from the United States from 1900 to 1910, but in 1911 Canada took second place and has occupied that place ever since. Germany was third in importations until the World War stopped relations. Her imports have been gradually increasing since the war. During the war Argentina, Denmark and Mexico competed closely with one another as the third largest importer of American apples.

New York City is the largest apple exporting point. The clearings for 1923 constituted 51.8 per cent of all exports of boxed apples from the country and 87.8 per cent of all barreled apples. In 1923, the apple exports amounted to more than \$16,000,000 in value. The shipments from New York were valued at \$11,500,000, which is 70.9 per cent of the total.

DURING the past five years the state of Washington has led in the output of canned apples. In 1923, that state packed 747,651 cases, and New York, which ranked second, packed 437,000 cases. Oregon and Ohio followed with 358,972 and 52,027 cases, respectively. Most of the canned apples are used for making pies, but there is also a large use of them for making apple sauce and apple butter.

Most of the dried apples are prepared in California and New York. In 1922, 362 cars were shipped from California and 870 from New York. These two states in that year produced 1222 cars of the total of 1390 cars for the entire country. Both dried and canned apples are exported to all parts of the world, and new markets are being developed constantly. In 1923, the percentages of the output of dried apples exported to various countries were as follows: Netherlands, 38.8; Germany, 17.1; Sweden, 12.1; United Kingdom, 10.2; Denmark, 8.7; Belgium, 2.5; France, 0.8; and all other countries, 9.8.

Canada has always been a good market for American canned and dried fruits, but a recent trade agreement signed between Canada and Australia accords to Australia the privilege of exporting to Canada at about one-half the duties charged on shipments from United States and other countries. In the past Australia has used all the dried fruits produced in that



country, but since the war the government has given large tracts of land to war veterans, who have planted orchards. The increased production which is expected will necessitate the development of foreign markets, and the agreement with Canada is one of the results.—Abstracted from a report of the Bank of America.

**THE BUREAU** of Agricultural Economics has recently issued a large report showing the origin and unloads of different perishables in Chicago during 1924. The origin of the different commodities is shown in detail. The report shows the number of cars of the different commodities unloaded in Chicago by months, and it also shows the states of origin of these commodities.

A total of 92,210 cars of perishables arrived in Chicago during 1924. Of this number 56,412 cars were unloaded in Chicago.

The report is a veritable mine of information about perishables, and it should be obtained and studied by every co-operative association and every person interested in the marketing and distribution of perishables. In past years the department has issued similar reports for other large markets and in all probability such reports will be issued for other large markets again this year.

**THE 1924-25** pineapple crop in Cuba will be about normal, but the acreage is smaller than that of last year, according to the Department of Commerce. The normal shipments to the United States are about 1,000,000 crates a year, but no estimates have been made for this year's crop. There is a tendency in Cuba toward decreasing the acreage in pineapples, it is reported.

**A SUMMARY** of the strawberry deal in White County, Ark., for 1924, prepared by R. L. Sutton, has recently been issued by the Bureau of Agricultural Economics. The summary gives the shipments from stations within the county, as well as prices, destinations, and other pertinent information. A table is included showing the shipments of strawberries from all of the shipping stations in Arkansas, arranged by counties. The United States grades for strawberries are included. A copy of this summary may be obtained by addressing the Bureau of Agricultural Economics, Washington, D. C.

**W. B. LANHAM**, marketing specialist of the Texas Agricultural College, states that 70 fig growers of south Texas, having a total of 2000 acres of figs, marketed co-operatively through their association in 1924, a total of 105,016 pounds of figs, which netted the growers \$600,303.96. Plans are on foot to extend the operations of the association to the entire Gulf Coast region of Texas. It is planned to build four canneries, at a cost of nearly \$150,000, to take care of the crops that are expected in future years.

**IN 1923** fruits and vegetables to the amount of 913,136 cars were shipped, according to a report of the United States Department of Commerce. Of this amount 343,626 cars were shipped by eight western states. Shipments from these states constituted about 38 per cent of the fruit and vegetable production of the entire country.

**SHIPPING** point inspection of fruits and vegetables proved successful in Oklahoma last season. A member of the staff of the state marketing commission recently made the following statement: "The shipping point inspection service in Oklahoma the past season has been worth to the producers more than \$100,000. Because of the advantages gained in selling by shipping point inspection, acreages will be greatly increased in watermelons, cantaloups, and sweet potatoes."

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This is the famous D&M, "The Lucky Dog Kind." Used by scores of important leagues throughout the country. Made with a genuine horsehide cover. Rubber cen-



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	Everybodys Poultry Magazine . . .	1 yr.	
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## Summary of Fruit Conditions

**BECAUSE** of the interest in the fruit crop at this season, we have been collecting information from various fruit sections. The results are presented below. In each case we have given credit to the person furnishing this information.

**Conditions in General.**—March weather was mild in all parts of the country on the average, compared with conditions in 1924. This caused earlier development of the trees. Early fruits bloomed in late March as far south as central Maryland and the intermediate Ohio valley. At the close of March, the season was about two weeks further advanced than normal.

The weather during March was drier than normal in the south, but there was more than the normal precipitation in the northwestern Great Plains, southern California and in some of the northeastern states. Severe drought continued in the Southwest. Heavy snows fell in the northeastern states. It was extremely cold in the Dakotas in the middle of March.—*United States Department of Agriculture.*

**New York Hudson Valley Section.** (April 8.)—Apples are not yet ready for delayed dormant spray at this date. In general fruit has come through the winter in good shape. Peaches and cherries were injured slightly in some sections back from the river. Sections near the river have set good crops. Apples give promise of a good bloom. What promised to be an early spring was delayed by cool nights. The season is just nine days ahead of that of 1924, which was considered an unusually late season.—*H. B. Tukey.*

**Michigan.** (April 8.)—Some peach buds were killed by the cold winter but there are still sufficient live buds for a good crop in the commercial fruit sections. All fruits in the commercial sections are in promising condition so far as known.—*V. R. Gardner.*

**Massachusetts.** (April 13.)—Fruit conditions seem to be satisfactory, although danger from spring frosts is not yet past. Peach buds apparently came through the winter in good shape, at least enough to make a full crop with favorable conditions. Japanese plums are loaded with blossom buds. Conditions all along the line seem to be as favorable as they could be. There has been no winter injury of wood, and, barring emergencies, we should pull through with a full fruit crop. The season is forward, but a light snow last night should help to slow things up.—*F. C. Sears.*

**West Virginia.** (April 6.)—Peach and cherry buds were damaged severely in some sections by the cold winter; in others there are prospects for a fair crop. In the eastern Panhandle section, the condition is quite spotted due to winter injury. In the state as a whole there are prospects for probably a quarter to half of a peach crop. Apples promise well but show severe infestation of aphids. Some growers are getting good control; others are not. Much depends on the weather at blossoming time.—*M. J. Dorsey.*

**Virginia.** (April 8.)—The fruit outlook is encouraging. The season is advanced in comparison with the average, due to a week of warm weather in March. A cool wave checked the development, however. Peaches were injured during January in the Valley and Piedmont districts. Considerable damage resulted in the lowlands of the Crozet, Charlottesville, and Timberville districts, decreasing with the elevation. Apple buds are of good size, well distributed, and in excellent condition. Plums were injured by spring frosts, and cherries and pears were injured to some extent. Growers are doing an excellent job of spraying as a rule.—*F. A. Motz.*

**Georgia.** (April 6.)—Cold weather in early March did some damage to peaches, particularly in Jones County. The set as a whole is not nearly as large as last year. Elbertas, which constitute 40 to 45 per cent of the plantings in middle Georgia, show a

light setting. The Georgia Belle is about like the Elberta. Hileys will bear the heaviest crop of any variety; the set is about the same as in 1924. Carman shows an unusually light setting. There is a fair to good set of Early Rose and Uneeda. All Red Birds have been pulled up. Growers are materially reducing the acreage of early varieties. There are very few Hales in Georgia; this variety has about a normal setting. There will probably be about 10,000 cars of peaches as compared with 13,400 cars shipped in 1924 and 7000 cars left in the orchards.—*Oliver I. Snapp.*

**Illinois.** (April 3.)—Peaches in the Ozark section of extreme southern Illinois promise a good crop in spite of the fact that about half the buds were killed during the winter. Peaches in the Centralia district and further north were all killed during the winter. The apple prospects are excellent all over the state.—*R. K. Loomis.*

**Missouri.** (April 8.)—Fruits generally came through the winter in good condition. All fruits, including peaches, have sufficient live buds to insure a good crop from central Missouri to the southern border. Peach buds in northern Missouri were killed during the winter. There are excellent prospects in all commercial sections for peaches, pears, cherries, plums, apples, grapes, strawberries, and bush fruits.—*T. J. Talbert.*

**Arkansas.** (April 10.)—There is every indication of a bumper fruit crop. There are few orchards in which the bloom is light. Nearly all orchards give promise of a heavy crop.

The peach crop in northern Arkansas promises a fair but not a heavy crop. Peaches in the central, southern and eastern parts of the state give every indication of a heavy crop. Cherries have been slightly damaged, although there are still indications of a full crop. Strawberries were slightly damaged by spring frosts, probably about 20 per cent. The stand of plants suffered from last year's drought. The crop will be somewhat short.—*J. R. Cooper.*

**Texas.** (April 7.)—Fruit and vegetable prospects are very good except for the extreme drought. Do not recollect a winter with as little precipitation as the one just closed. Fruit blossoming heavy in practically all parts of the state, without a late frost to date. A splendid crop has set in most sections. With sufficient rain during the season, the fruit crop should be heavy.

Citrus fruit along the Gulf Coast and in the lower Rio Grande Valley suffered from a severe freeze in December. Older trees suffered little, but the loss in nursery stock and young trees was heavy. Fruit on the trees was damaged 25 to 30 per cent.—*A. T. Potts.*

**Oregon.** (April 8.)—Reports from county agents indicate that winter damage was somewhat spotted. Apples were not seriously damaged in any section. Pears show considerable blackening of the cambium and the basal region of the fruit spurs, but the blossoms appear to be normal. Peaches on lower land suffered considerably, the loss varying from 20 to 100 per cent. Peaches on the hillsides seem to be in good condition.

Young cherry trees were hurt considerably in some sections by freezes. Trees in valleys will probably have a light crop, but the crop should be good on the hillsides. The cherry crop will probably not be the equal of last year's crop.

Cold weather killed a good many plum and prune buds. A light crop is in prospect. Young trees four to eight years old were hurt very seriously on some of the heavier land, due to late root growth last fall.

Blackberries and strawberries show little winter injury. Red raspberries suffered seriously in some sections. Growers are mowing the vines off at the crown in some places. The com-



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mercial crop will probably be cut a third to a half. Severe damage is also reported from the Puyallup district of Washington. Wild Evergreen blackberries show some winter damage and will probably produce not over 50 per cent of a crop. Loganberries trellised last fall show severe injury; those on the ground during the winter came through in much better shape.

Walnuts were damaged considerably in the lower Willamette Valley near Eugene and Lebanon. In the northern part of the valley, which contains the largest acreage, little, if any, damage occurred. The crop as a whole will be cut about 25 per cent.—W. S. Brown.

California. (April 7.)—Heavy spring rains have supplied the soil with sufficient moisture to produce a good fruit crop. The damp spring has caused serious outbreaks of brown rot of apricots, especially in coast counties. Some orchards show a loss of 90 to 95 per cent. Orchards sprayed properly show practically a clean crop. Shot-hole fungus also is causing damage. These two diseases, together with the light bloom due to dry weather last year, will cut the apricot crop materially. Prices should be good, due to a short crop and complete selling out of the dried and canned apricots during the winter.

It is too early to forecast the peach situation. Because of wet conditions, spraying has been difficult and as a result many orchards were sprayed when the trees were in bloom or starting. Severe lime-sulphur injury resulted in many orchards.

The prune, apple and pear crops promise to be normal. No winter injury is apparent. Cherries promise a normal crop.—W. P. Tufts.

## Summary of Market Conditions for Fruits

THE SUMMARY of fruit marketing conditions given below was furnished the AMERICAN FRUIT GROWER MAGAZINE by the United States Bureau of Agricultural Economics under date of April 10.

With southern cabbage, onions, and potatoes coming on the market in rapidly increasing volume, most winter produce tended toward lower levels in April. Apples were about to wind up a very good season, just as the southern berry movement became heavy. Unusually early activity among southern crops has upset the market.

### Apple Market Firm

Cold storage holdings of western apples early in spring were about three and a half million boxes lighter than last year, and close to a million boxes below the five-year average. While barreled holdings were almost a million barrels less than at the same time last season, they were only slightly below the five-year average. Shipments from eastern states have been very much lighter than during the corresponding time in 1924, and boxed apples have moved at an average rate of 30 cars a day, which is about one-third of the corresponding daily rate last year. Seasonal apple totals to date from all sections are more than 33,000 cars, or one-fourth, short of the movement to April 10, 1924, and total volume has slowed down to about 100 cars a day. The market situation continued firm in April, with advances of 50c-\$1 per barrel for eastern and midwestern stock in city markets. New York Baldwins ranged \$6.25-\$7.50 and Greenings as high as \$7.50-\$8. Illinois Winesaps brought \$8 in the Middle West, with Ben Davis stronger at \$5.25. A few Northwestern Extra Fancy Winesaps were quoted at \$2.75-\$2.85 per box f.o.b., advancing to \$3.50-\$3.75 in city markets. Delicious sold generally higher at \$4.25-\$4.50 and Romes reached \$4. Current prices are about \$1-\$1.50 per box and \$3-\$4 per barrel above last year's level, so that apples seem to be cleaning up at considerable profit.

### Berry Season On

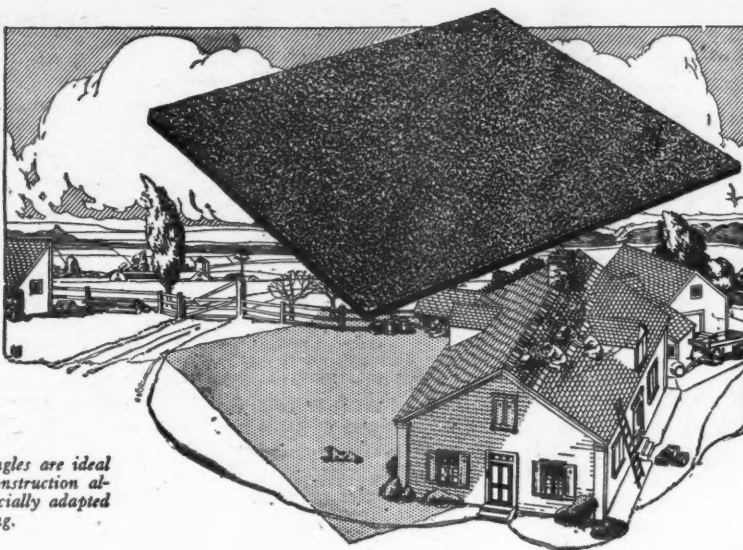
The Louisiana strawberry crop has begun to move to market about two weeks earlier than last season. There

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is some evidence that the crop will not be as large as last year's, although it is predicted in berry districts of the state that movement will be perhaps 1400 or 1500 cars, against 1860 in 1924. Quality of berries moving from the Hammond district in April was considered good, averaging generally better than the year before. Louisiana Klondikes recently sold at \$4.80-\$5.20 per 24-pint crate f.o.b. Hammond and \$5.50-\$6.25 in city markets. The general price level has been about like that of last season. Florida berries declined at the opening of the Louisiana season to 35c-40c, quart basis. Carlot movement was about 1200 cars by mid-April; far ahead of last year's shipments, owing to the earliness of the season.

3,389,000 boxes as compared with 5,837,000 boxes on April 1, 1924, and a five-year average of 3,964,000 boxes.

317,000 bushel baskets as compared with 471,000 bushel baskets on April 1, 1924. No five-year average is available for apples stored in bushel baskets.

The teacher was explaining the meaning of some new words to her class of youngsters.

"An anecdote," said she, "is a short, funny tale."

This having been repeated in chorus by the children, the teacher continued: "And now I want you to write a sentence containing the word 'anecdote.'"

This was one of the sentences presented for her consideration: "A rabbit has four legs and one anecdote."—*Australian Christian*.

The strawberry crop at Plant City, Fla., for the second time in the history of its cultivation at that point, passed the million-dollar mark. The returns show \$1,002,485.32 received for 3,723,030 quarts of berries.

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WILL YOUR 1925 fruit top the market at fancy prices or be sold for cider at less than it cost to produce?

PROPER pruning, fertilizing, cultivation and thorough timely spraying will put your 1925 fruit in the fancy price class.

SPRAYING is the most important of these factors, therefore your sprayer must be right. It must develop high pressure and the spray discharged through a gun that makes a fine driving mist that is driven into all parts of the tree. IT MUST completely envelope every leaf, twig, branch, and bud by producing the maximum "AIR-DRAFT."

WRITE for our orchard sprayer catalog and learn about the many exclusive "Friend" features. Don't delay! Time is short and orders must be in at once for spring delivery. Also hand, traction and combination sprayers.

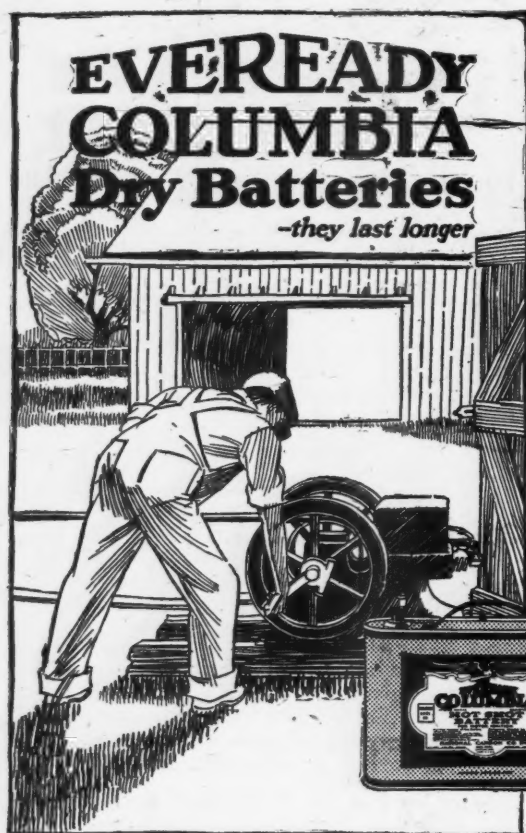
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general stores

## Use of Tractors in Fruit Growing

(Continued from page 11)

however, a tractor should always be in readiness for long and continuous employment on short notice, for proper care will include a careful inspection or even an overhauling, if this should be necessary, during the slack periods, and thus insure having it in proper condition for rushing the work along.

### Inspection and Overhauling

In this connection a few words as to what constitutes proper care and preparation of the tractor for such work may not be amiss. With such care the likelihood of delays is greatly reduced, as is also the cost of upkeep on the tractor.

It will be noted above that both inspection and overhauling were mentioned. One is just as necessary as the other, but neither should be permitted to take the place of the other. Inspection costs little, and should be worked overtime. Overhauling is more expensive, and should be done only when inspection shows it is necessary. The tractor should be carefully inspected during every period of idleness and as long before the tractor will again be needed as can conveniently be done, so as to give ample time for making repairs or doing general overhauling if this is necessary.

But a tractor should not be overhauled at random; this is not only incurring unnecessary expense but may do as much harm as good.

It takes but a few minutes to look over a tractor and determine its condition. First of all, try the compression by cranking it slowly and noting whether there is a strong and equal compression on each cylinder, and no hissing past the valves or rings. If the compression is good on all cylinders, the valves and rings must all be in good shape and the cylinders not scored enough to cause leakage. In such a case there is no use pulling the pistons or grinding the valves.

By removing the spark plugs and noting whether the porcelain or mica insulation is free from carbon, it can be told whether each plug has been firing its cylinder regularly. Badly fouled or oily plugs show that that cylinder has been missing. Clean plugs mean all is well. At the same time note the width of spark gap, and if the points are badly melted away where the spark has been jumping, bend them a little closer together, until they are about the width of a thin dime apart.

### Keep the Combustion Chamber Clean

An inspection of the combustion chamber through the spark plug hole will show whether there are heavy carbon deposits on the piston head and other parts. If not, and the compression was good, it would be a waste of time to open up the engine. Such an inspection is just as much assurance that these parts are in proper condition for hard work as disassembling and reassembling the engine would give.

Now as to the engine bearings. If there was any serious looseness, it would have been indicated by a knocking or pounding the last time the tractor was used. However, if there are inspection holes in the crankcase, it is easy to check up on the condition of the bearings by rocking the flywheel back and forth while holding the fingers on the different bearings. If any appreciable play is felt on any of the connecting rod, main, or piston pin bearings, then the bottom of the crankcase should be removed and such bearings tightened.

If there are no inspection holes, it will be advisable to remove the bottom of the crankcase and make an inspection of the bearings, at the same time taking advantage of this opportunity to wash out the oil pan thoroughly and remove all sediment.

### Keep the Bearings Tightened

Whenever inspection of an engine bearing indicates any looseness, it

should always be tightened at once. By frequent inspection and tightening before any great amount of looseness has occurred, the bearings will not only last much longer, but are much less likely to become loose enough during the working periods to demand tightening.

Inspection of the engine parts as mentioned is of the greatest importance, but an inspection should always include all parts of the tractor. A competent operator can generally tell very closely the condition of different parts while the machine is in use, and will notice the gradual wear of the steering mechanism, wheel and axle bearings, fan belt, ignition wires, etc., and will keep such parts in good condition at all times by making replacements or adjustments during the working season. It takes only a few minutes, however, to look over all these parts carefully while making a general inspection, thereby making certain that none of these is likely to cause a delay when the tractor is again put to work.

### Do Not Delay Making Needed Repairs

The practice of frequently inspecting the tractor and making repairs and adjustments whenever they are necessary or appear likely to be necessary in the immediate future, is more commendable than the practice of keeping the tractor at work for a certain period and then giving it a complete overhauling, regardless of the condition of the various parts.

It is impossible to establish any definite amount of work or period of time after which a tractor should be overhauled. This will vary with every case, depending upon the nature of the work, the operator, the kind of oil used, and many other factors. Some



Close work with a tractor. The front wheel of the plow is in line with the center of the tractor and both are running straight, with no side draft.

tractors will do a large amount of work every year for several seasons without ever needing an overhauling, or any extensive repairs. On the other hand, there are cases where for some reason or other a tractor engine may need its valves ground, or its bearings tightened, or its rings replaced, after only a short period of work.

A careful inspection should be the only guide in overhauling or repairing.

## Apples or Cedars in the Fruit Industry

(Continued from page 7)

sides of the trees; when galls are found they should be promptly removed.

### Legislation for the Control of Pests

Several states have nursery and orchard inspection laws upon their statute books. These laws give the state, through its proper officials, authority to take the necessary steps to

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prevent the spread of dangerous in-  
sects and plant diseases.  
Cedar rust is one of the pests which  
comes under the control of such laws  
in several states. The control of red



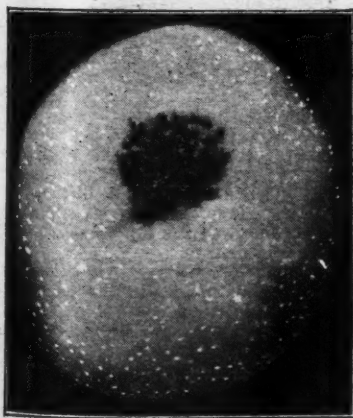
Cedar rust on the upper surface of an apple leaf

cedar rust through legislation is not  
an entirely new idea. Several states  
have had the necessary laws on their  
books for several years, although ag-  
gressive campaigns for eradication of  
cedar rust have been undertaken in  
only a few states. Among the states  
which have laws covering this matter  
are Arkansas, Illinois, Virginia, West  
Virginia, New York and Missouri.

#### Need of Co-operation

As with the administration of all  
laws, however, much more can be ac-  
complished in any community where  
cedar rust is a menace if all the peo-  
ple concerned co-operate for their  
mutual good. In communities where  
fruit growing is important, or where  
the apple is a great deal more impor-  
tant than the red cedar, there should  
be no question as to the cutting of all  
cedars within a mile and a half or two  
miles of apple orchards. On the other  
hand, if there are practically no com-  
mercial orchards in a community, and  
the orchard business is not considered  
of commercial importance, perhaps it  
would not be wise to insist upon the  
cutting of red cedars near small plant-  
ings of home orchards. In such in-  
stances the varieties of apples making  
up small plantings might well consist  
of kinds which are not susceptible to  
cedar rust injury.

The red cedar trees which generally  
do the greatest harm in commercial



Cedar rust on the apple fruit

apple growing districts are those which  
are allowed to grow along the road-  
sides on pasture lands and on rough  
and uncultivated waste land. Such  
trees may never have any commercial  
value and should be destroyed.



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that have gone  
6,000 miles and  
they look like they  
had been run only  
1,000 miles. Here-  
after nothing but  
Riversides for me.

William Sale,  
Cloquet, Minn.

Have used a pair of  
Riverside Cords for  
a year, over 10,000  
miles, and they are  
still good. Other  
cords put on at the  
same time are  
gone.

Mr. M. A. Smith,  
Sioux Falls, S. D.

I have a Riverside  
Tire that has been  
on my car three  
years and seven  
months. Two of  
my neighbors are  
now using River-  
sides after seeing  
the splendid service  
they gave me.

J. R. Johnson,  
Pingree, N. D.

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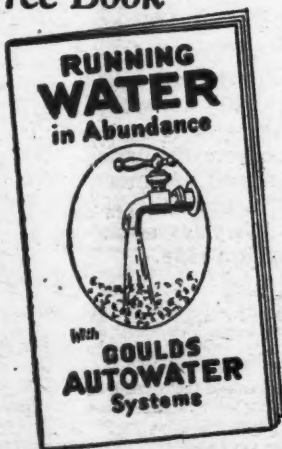
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### The Inside Story of the Apple

by J. R. Magness

United States Department of Agriculture

"The Inside Story of the Apple" is a  
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The Alternate Bearing in Apples  
The Setting of the Fruit  
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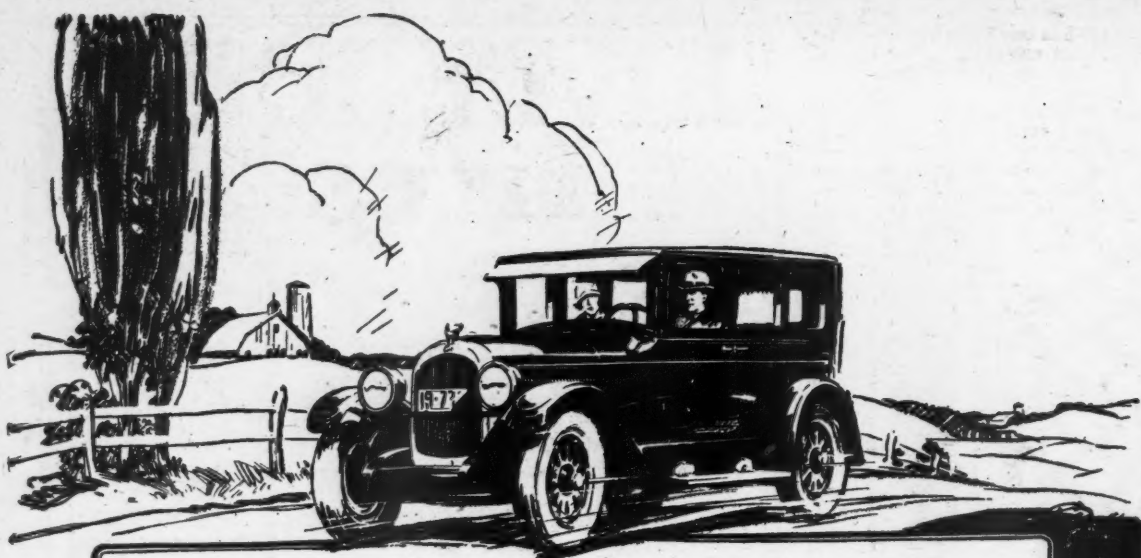
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# CHRYSLER SIX

## Summer Pruning of Apple Trees Questionable Practice

THE SUMMER pruning of apple trees as a means of increasing fruitfulness is open to question. At least the results are so conflicting that it cannot be laid down as a general rule, as is sometimes stated, that summer pruning does induce heavier fruiting. Summer pruning usually consists in cutting back the terminal branches more or less.

Summer pruning not only fails frequently to increase fruit production but it may decrease it. Apparently there is some difference in the results in different regions, depending on the manner in which the different conditions affect the growth of the trees. There are also differences in results as between young trees growing rapidly and older ones that are fruiting. Summer pruning that reduces the leaf surface beyond a certain limit means a restricted growth of the tree, the growth being dependent upon the leaves to elaborate plant-food material. Different conditions of growth and food supply, however, may affect the results; also the time in the summer when the pruning is done.

In the case of bearing trees, if the leaf area is unduly reduced in summer pruning, not enough plant food is elaborated to nourish the tree and develop the fruit buds. As a result, bearing trees which are pruned too heavily in summer may not produce as much fruit as trees not pruned in summer.

On the other hand, the checking of excessively strong growth at the right time by a limited amount of summer pruning may result in the formation of a larger number of fruit buds than would otherwise occur. This is when the pruning does not reduce the leaf surface beyond a point where the elaboration of plant food, which goes on only in the leaves, is adequate. Because of these uncertainties the grower should usually resort to summer pruning with considerable caution until he determines what its effects are likely to be under his particular conditions.

—U. S. D. A.

## Illinois Tornado Does Little Damage to Fruit

R. K. LOOMIS of Makanda, Ill., reports that the tornado in southern Illinois did little damage to the fruit industry in that section. The tornado passed between the two important fruit districts of southern Illinois. The Ozark section, containing large plantings of early apples and peaches, lies in the counties south of the path taken by the tornado. The Centralia-Olney district, comprising large plantings of peaches and late apples, lies well to the north. There were a few scattered orchards which suffered severely, but the storm missed the main orchard plantings. There was a high wind for a considerable distance outside the tornado area, but because of the dormant condition of the trees, this did practically no damage.

The damage to farms in general, however, was great. In five counties in southern Illinois alone the losses were serious on 573 farms. The average loss per farm, with deductions allowed for insurance, was about \$2336. On many farms not a building was left intact.

Large sums of money were raised for the afflicted people in the storm area. Radio stations, newspapers, and civic organizations in Chicago and elsewhere performed praiseworthy service in raising money for the storm-swept section. About \$1,000,000 have been raised to date.

Dr. A. S. Colby of the University of Illinois, who edits the small fruit department for the AMERICAN FRUIT GROWER MAGAZINE, will give a talk over Radio Station WLS in Chicago during the noon hour on May 1. We urge that readers listen in on this talk and get acquainted with Dr. Colby.



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## The powerful pressure of a HERCULES



**makes your  
spraying  
more thorough**

It is not enough merely to spray trees. They must be sprayed **THOROUGHLY**—with power enough to penetrate to every part of the tree. Not to have a spray rig ready and powerful enough to do the job **RIGHT**, is to risk very heavy losses.

The economy and dependability of the Hercules has made it preferred wherever spraying is done. It makes short work of a big job—and makes that job complete. The Hercules always runs itself. It needs no attention—starts easily—is economical to run. It seemingly never breaks down.

There are a host of other farm uses for the Hercules—running the washing machine, the grindstone, the pump, the saw, the feed mill—all the hard jobs that are just so much drudgery but that must be done. The Hercules does them quicker, more economically—and more efficiently.

Behind every Hercules Engine is the five-year guarantee of the Hercules Corporation. In every one of them is the same sturdy construction, the same excellence of workmanship.

There should be a Hercules Dealer near you. He will gladly demonstrate the Engine to you. Write us your power problems and let us advise you.

**The Hercules Corporation**  
Engine Div., Dept. S,  
Evansville, Indiana

## HERCULES ENGINES

On the Ocean Front Capacity 1000  
**The Breakers**  
ATLANTIC CITY, N. J.  
American and European Plans. Sea Water in All Baths  
Orchestrated by  
Atlantic City, N. J.  
JOEL HILLMAN, President

## HAYES Fruit Fog Sprayers

Built like an automobile in one of the largest sprayer factories in the world. Every part mechanically perfected, simplified to give utmost performance, yet easily accessible. Nearly fifty models, ranging capacity from 3½ to 16 gallons per minute, with 300 lbs. pressure guaranteed. Our small outfits are as efficient, as highly developed, as our big Triplex Sprayers. They vary in capacity only. Quoted with or without trucks, engines, pumps, tanks or special equipment.

**SEND FOR CATALOG**  
before you buy. We also make a full line of traction and hand sprayers.

Distributors in all fruit sections  
**HAYES PUMP & PLANTER CO.**  
Dept. 15, Galva, Ill.

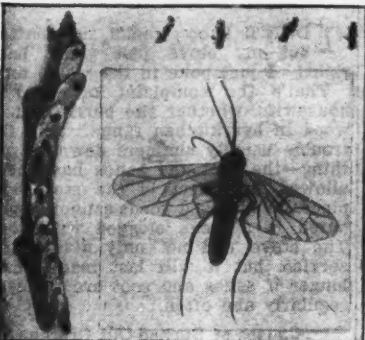


## Friends of the Fruit Grower

(Continued from page 18)

aphid. When one considers the small size of most aphids, it is not difficult to conceive the size of these aphid parasites.

Practically all scale insects in California are preyed upon by parasitic Hymenoptera, notoriously among which are the black scale parasite, European fruit Lecanium parasite, soft brown scale parasite, Scutellista, etc. Most of these are from one-eighth inch in length down to microscopic in size.



On the left is shown katydid eggs attacked by a beneficial parasite—note the exit holes of the parasites, four of which are shown above. The winged insect on the lower right is a parasite bred from a syrphid fly larva, the latter a beneficial insect

Although most of these valuable parasites are exceedingly small in size, the work they do is of utmost importance to all fruit growers. As a rule, the work they do is unnoticed by the average grower, but nevertheless they are one of the chief sources which make fruit production possible in many sections which are subject to certain insect infestations.

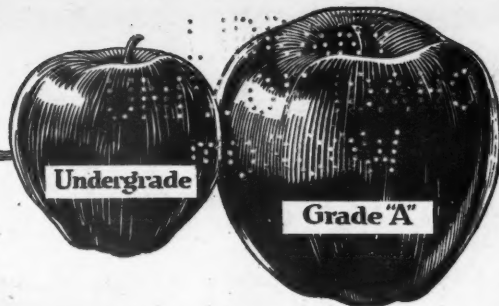
Another class of important parasites is that made up of the Tachina flies. The larvae of these flies feed upon many forms of destructive insects. Many of these flies resemble the common house fly in appearance except that their bodies are larger and more hairy. Most of these flies lay their eggs on the body of the host, generally the larval form. Upon hatching, the body of the host is entered and the good work begins. Many destructive moths are destroyed by these Tachina flies.

All workers of the soil have a lot to be thankful for in having nature provide them with the innumerable predaceous and parasitic forms of insects. Profitable culture of the soil would practically be an almost impossible task were it not for these valuable "helpers." Growers should not lose sight of this fact and should take extreme care before undertaking a campaign against an unknown insect. It may be a friend and not an enemy. When in doubt have it identified by someone who knows insects.

## New Film on Black Mold in Strawberries

"WHY STRAWBERRIES Grow Whiskers" is the title of a new film produced by the Department of Agriculture for the Bureau of Plant Industry. It is designed to help growers and shippers in their war against black mold. In a few seconds on the screen the film shows the development of black mold through a period of 24 hours or more.

This film will be circulated through the Educational Film Service of the Department of Agriculture and co-operating state institutions. Copies may be borrowed for short periods or they may be purchased at a liberal charge. A complete list of films available from the department, with information on the method of distributing them, is contained in Miscellaneous Circular 27, which may be obtained from the Department of Agriculture, Washington, D. C.



## Get Grade "A" Prices For Your Undergrade Apples!

A big demand—no waste—and top prices! That's how cider-making by the Mount Gilead Process brings big cash profits the year 'round from the sound undergrade end of your apple crop. This remarkable process is being used by some of the country's foremost orchardists. And in each case the results have proved its entire success as a sound, all-year-round money-making proposition.

### The Mount Gilead Process

turns out pure, healthful cider that keeps sweet indefinitely, and that conforms in every way with all Federal Prohibition Regulations. It retains its original satisfying flavor and real food value without the use of harmful chemical preservatives or other adulterants. It is fresh sweet cider—just as it comes from the press, and there is a constantly increasing demand for this purest of pure-food drinks!

### This Book Free To You!

This complete and reliable handbook on cider-making tells you how cider-making will produce large cash returns from your apple crop. It fully describes the Mount Gilead Process and Mount Gilead Cider-Making Equipment. It gives you information on marketing the high-grade products of this famous process. Just mail the coupon below and we will forward your copy promptly.



We manufacture a complete line of cider presses from small hand presses to the largest hydraulic types for custom and commercial use. There is a Mount Gilead outfit to handle your requirements—completely—for making cider and all cider products, at the farm, roadside market, custom mill, or orchard.

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HYDRAULIC CIDER PRESSES

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A Standard Held  
High for 86  
Years

**Eliminate Uncertainty  
with this Quality Pledge**

For 86 years, GRASSELLI GRADE has been a standard by which to measure chemical products.

Therefore, when this Company took up the manufacture of Insecticides and Fungicides 15 years ago, it had more than 71 years manufacturing experience to build on.

GRASSELLI Spray Products are made with one, and only one, consideration in mind—to eliminate experiment and give the best return to the user.

In every fruit-growing and farming section, you will find a distributor for GRASSELLI GRADE—

Arsenate of Lead Calcium Arsenate Lime Sulphur  
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THE GRASSELLI CHEMICAL COMPANY, CLEVELAND  
Founded in 1839

**GRASSELLI GRADE**  
Insecticides and Fungicides



## Bringing a Giant to School

Teaching tricks to a giant is child's play compared to the problems met by the men who trained electricity to the service of mankind.

It took over a hundred years from the time Franklin first brought electricity from the clouds, before the electric light and power industry could make even its first crude beginning. But now, in less than half that time this industry has leaped from nothing to the service of sixteen million consumers.

The day in 1882, when Edison opened his first generating station in New York, marks the birthday of electric light and power service. It was 1884 before electric motors could be bought. The transformer without which the range and usefulness of electric power would have been forever restricted was brought out in 1885 by William Stanley. In 1890 the first long distance power line was built in Colorado, and water power development became a practical possibility.

Since that time cheaper production and wider distribution have been the problems on which the industry has concentrated. The steam and water turbine and the mercury boiler are making cheaper production possible. High power transmission lines and interconnection are daily broadening the territory served.

The task now engaging the best thought of the industry is electric service for the farmer. This is still the greatest problem of them all.

The Committee on the Relation of Electricity to Agriculture is composed of economists and engineers representing the U. S. Departments of Agriculture, Commerce and the Interior, American

Farm Bureau Federation, National Grange, American Society of Agricultural Engineers, Farm Lighting Manufacturing Association, and the National Electric Light Association.

## NATIONAL ELECTRIC LIGHT ASSOCIATION

### PERSONAL STATIONERY 200 SHEETS and 100 ENVELOPES \$1.00

Printed with your Name and Address. Clear, white bond paper, with envelopes to match. Your name and address printed in beautiful, rich blue ink, on both paper and envelopes, and sent to you postpaid for only \$1.00. (West of Mississippi river and outside of U. S. \$1.10.) If inconvenient to send the money, we will ship C. O. D. Money returned if you are not more than satisfied. Order today. Write name and address plainly: AGENTS MAKE BIG MONEY taking orders for us. Write us today for our agent's proposition.

ELITE STATIONERY COMPANY  
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STOPS HAIR FALLING

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**HISCOX CHEMICAL WORKS**  
PATRICQUE, N.Y.

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Sprays 5 to 6 acres potatoes a day. 5-gallon tank. Air chamber gives steady, fine, mist spray. Uses all spray solutions. Write for free catalog and price.

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### Whatever Your Question

Be it the pronunciation of vitamins or marquisette or soviet, the spelling of a puzzling word—the meaning of overheard, neovaccine, etc., this "Supreme Authority."

**WEBSTER'S NEW INTERNATIONAL DICTIONARY** contains an accurate, final answer. 407,000 Words. 2700 Pages. 6000 Illustrations. Regular and India Paper Editions. Write for specimen pages, prices, etc. FREE Pocket Maps if you name American Fruit Grower Magazine.

G. & C. MERRIAM CO., SPRINGFIELD, MASS.

## CHATS WITH FRUIT GROWER'S WIFE

By HAZEL BURSELL



### Care of the Kitchen Range

"I DON'T know what's the matter, but my stove just won't bake right! I just poke in the wood, too."

That's the complaint of many a housewife, whether she burns coal or wood in her kitchen range. And the trouble usually simmers down to one thing—the soot and ashes have been allowed to collect in the stove and pipes. Well-baked foods cannot be prepared in a stove clogged with soot. The stove will not only give better service, but it will last many years longer if ashes and soot are removed regularly and often.

#### Causes of Burned-Out Grates

Stove dealers will tell you that the chief cause for burned-out grates is letting the ashes pile up in the firebox so that the heat is retained long after the fire is out. In this way the grates are kept hot almost continually. This is especially true of a coal-burning range. Banking the fire over night is another bad practice for the same reason. If you would have your stove last, you should let the fire go out at night and rebuild in the morning. One dealer has said you can lengthen the life of stove grates 10 years if the ashes are shaken down once or twice daily. A cheap stove is poor economy. Purchase a stove of recognized make, and then take care of it.

Next in importance is keeping the soot removed from under the oven. Many housewives make a practice of cleaning this place about once or twice a year, and thus, during most of the 12 months, the stove bakes poorly. When soot is left under the oven, hard firing is necessary to make things "brown on the bottom," and in time this will cause the back and lining of the stove to burn out. The best system is to form the habit of brushing the soot and ashes off the top and sides of the oven once a day when the fire is built. Be sure to remove soot from the corners and crevices. If done each day it will take only a few minutes.

The "butterfly" in the back of the stove should also be cleaned. Open the trap, insert a poker or stove rake and push the soot downward into the space below the oven. Then remove, along with the soot that has been deposited under the oven, through the regular clean-out door made for the purpose. The space below the oven should be cleaned not less frequently than once a week.

#### Clean Stove Pipes Often

The stove pipe also needs its share of attention. If allowed to become clogged with soot, it may be responsible for the lack of draught and consequent difficulty in building a good fire. It may be half full of soot, especially if it is a long pipe or has several turns in it. The height of the chimney may also have something to do with the lack of sufficient draught, and this will be even more noticeable in a sheltered valley where there is little breeze. This point should be taken into consideration in the building of the chimney, as such a defect as a too-short chimney would be hard to remedy later.

Do not let your stove get red hot, or do not keep it red hot for any length of time. The stove lids will become warped if the stove is kept too hot. The drafts should be properly adjusted to prevent over-heating. Piling up coal in a coal range until it touches the top of the stove will also cause the lids to warp. Burning wet garbage may cause cracking through the sud-

den cooling when water meets the hot iron.

There are several points in the daily care of the kitchen range which should be mentioned. If observed, the stove will "look like new" even after years of service. The enameled surfaces should be cleaned daily with some non-gritty scouring powder. If the grease spots are not removed promptly, they will burn on, and they cannot be removed without scraping, which will injure the enamel, both in appearance and wearing quality. The sheet iron part of the stove should be given a good "blackening" once or twice each year, or even oftener. They have blackings on the market now which are advertised as fire-proof, and these should keep their polish longer. The nickel trimmings can be most satisfactorily and quickly cleaned with Bon Ami. This should also be done daily.

Never wash dishes on the stove as the griddles will rust out in time, and the spilling of water on the hot stove is not the best thing for it. Then besides, the dishwasher gets unnecessarily heated in the process.

#### Rub with Greased Rag

I learned a secret from an elderly Swedish friend of mine whose stove really looked like new after 35 years of constant service. She said, "Don't wash your stove top with water, except some special spot. Keep a rag, which has been slightly greased with some non-salty grease or oil, for the purpose. Rub the stove top over with this as often as needed and it will always look nice." If some bit of gravy or fat gets burned on, you will have to take that off with steel wool or some other type of kettle scraper. Then polish with the oiled rag.

If the stove is not to be used for some time during a long vacation, it should be given a thorough coating of grease (non-salt) to prevent rusting during the family's absence. The stove pipe should be taken down, cleaned of soot, oiled and left down, as rain coming down the chimney may cause the pipe to rust out in one season. If a certain stove is not used during the summer, paper should be burned in it occasionally to dry out the pipes and the inner parts of the stove. The life of the stove will thereby be greatly lengthened.

#### Note Firebox Depth

Just one more point which may or may not properly belong under the care of the kitchen range. When you are selecting your range, be sure to take into consideration whether you will burn mostly wood or coal. The firebox in a coal-burning stove is much deeper than is best for the wood-burning stove. Do not buy a stove with a firebox designed for coal when you plan on burning wood. I have several friends who made this mistake and they have had to burn an extra amount of wood to secure the same oven temperature.

#### Short-Cuts in Mending

TO MOST housewives mending is pure drudgery. It has to be admitted that there is nothing especially interesting about this necessary and worthy piece of home making. But there are some little tricks of the trade that make the work quicker and easier, and hence relieve one of some of the drudgery.

#### To Mend Silk Hose

The writer's pet labor saver in mend-





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ing is in the "rejuvenation" of silk  
hosiery. I keep in my mending basket  
pieces of black, gray, brown and white  
crepe de chine. Then, when a silk  
stocking begins to wear in the heel or  
toe, I cut a patch of the matching  
colored silk large enough so that, when  
doubled, it will completely cover the  
worn place and the thin part around  
it. I double the patch and sew it in  
place on the wrong side, pinning the  
corners down before stitching. Then  
I turn to the right side and stitch the  
frayed edges of the hole down to the  
silk patch. The stocking will then  
wear a long time, and, best of all, it  
will look and feel just as nice as it  
ever did. Be sure the patch is large  
enough to cover the thin area well, oth-  
erwise the stocking will simply wear  
out around the patch. The silk rein-  
forcing should not extend up above the  
oxford top nor too far down in the  
heel.

When mending a "runner" in silk  
hose or other knitted silk, be sure to  
catch the broken stitches, or else your  
work will be wasted. No matter how  
much you "embroider" the broken  
place, the runner will continue unless  
the loose stitches are caught. Your  
hose will look much nicer if all broken  
places or caught threads are fastened  
before they get to the "runner" stage.

The chief things that insure good  
results in mending are the right color  
and texture in material and a match-  
ing color in thread. Do not use cotton  
patches on silk or wool garments, or  
red polka dots on a plain material.  
Silk garments and silk patches call for  
silk thread in mending. Then, aside  
from the point of appearance, cotton  
thread "cuts" the silk fibers so that  
the garment will wear out sooner.

#### Lace Is a Real Problem

Lace is a problem all by itself. It  
does pay to darn or reinforce lace  
with net for the first two or three  
holes, but after that it should be ripped  
off and replaced with new. If it is  
left on, it will have to be mended every  
time it is washed, and probably sev-  
eral times in between besides. Your  
time is too valuable for that. Of  
course, if you should be so fortunate  
as to possess a valuable piece of real  
hand-made lace, every bit of effort you  
expend in its preservation is worth  
while.

If some of your undergarments have  
lace bands around the top, or lace in-

sets in the bands, the lace will wear  
much longer if, when you set on the  
straps in the first place, you cut them  
long enough to extend clear to the  
lower edge of the band on the wrong  
side. This will reinforce the band and  
the insets so that the strain will fall  
on the straps. You will in this way  
save much mending.

Mending tissue melted into the gar-  
ment to hold the torn or cut edges to-  
gether has been used with very good  
success for woollens, especially men's  
clothes. Now they have a patented  
mending tissue which is made for silk  
stockings and other lingerie and is  
guaranteed to hold even through  
washings and ironings. The writer has  
not tried it, however.

I have found that men's pajamas  
tend to split on the stripes in the  
goods, where there is any extra strain.  
To meet this problem and save myself  
much work later, I usually reinforce  
the outing flannel "sleepers" across  
the shoulders with a piece of the same  
goods run the other way of the mate-  
rial. Cut the piece to fit and stitch it  
in the shoulder, neck and arms' eye  
seams. This reinforcing may be done  
after the garment starts to wear out,  
but it is easier to do it in the first  
place.

#### Choose Materials Well

The materials used in mending have  
much to do with the amount of work  
involved. You can use silk ribbon in  
varying widths and matching colors  
(I always keep a collection of ribbons  
in my mending basket) to patch worn  
places in silk underwear, or to rein-  
force the hems or other places need-  
ing mending in silk or wool dresses.  
The ribbon is soft and not bulky and is  
quickly put on as the edges do not  
have to be turned under. A cotton  
tape about an inch in width will be  
found invaluable for mending straight  
rips and tears in cotton garments.  
Here again, the patch requires no turn-  
ing in on the sides.

For certain things white organdie  
stitched on the wrong side makes an  
excellent stay to hold torn edges to-  
gether. Crepe de chine is by far the  
best silk material known for all kinds  
of mending on silk or woolen mate-  
rials requiring a larger patch than a  
ribbon would make. It wears well, is  
rather inexpensive, holds its color, is  
soft and flexible, and always makes a  
"comfortable" patch.

## Salad Dressing Recipes

MANY recipes for tempting salads have been given in this department, but  
so far an important part of the salad has been neglected—the salad  
dressing. In this issue we shall endeavor to remedy the omission. Dress-  
ings for all types of salads are included in the group. You will find those  
suitable for fruit salads, and of these the dressing made with condensed milk  
is exceptionally good. Then there are dressings for potato salad, combination  
vegetable, cabbage, shrimp, lettuce, cottage cheese and other salads.

#### Boiled Dressing

1 T. flour  
1/4 T. sugar  
1/4 c. vinegar  
1/4 T. salt

#### Little cayenne

Mix dry ingredients, add beaten egg  
yolks, then milk, and lastly add vinegar  
gradually. Put in upper part of double  
boiler and cook until thick and smooth,  
stirring constantly. When it begins to  
thicken cook less rapidly to avoid any  
danger of lumping. Thin with more  
vinegar and milk if necessary. Add but-  
ter just before removing from the fire.  
Keep in cool place. Serve on lettuce, po-  
tato or any kind of vegetable salad.

#### French Dressing

1/4 t. salt  
1/4 t. pepper  
1/4 t. paprika  
2 T. vinegar or lem-  
on juice  
1 T. olive oil

Put ingredients in small glass jar, cov-  
er, shake thoroughly and serve at once.  
Some prefer the addition of a few drops  
of onion juice. One tablespoon each of  
lemon and vinegar may be used. If pre-  
ferred, 1/2 t. powdered sugar may be used,  
with the pepper omitted. French dress-  
ing and its variations is suitable for many  
types of simple salads, lettuce, cabbage,  
shrimp, etc.

#### Martini French Dressing

To French dressing, given above, add  
1/4 t. finely chopped parsley and 1/4 T. fine-  
ly chopped green pepper.

#### Tabasco French Dressing

4 T. olive oil  
1 T. lemon juice  
1 t. powdered sugar  
1/4 T. pepper  
5 drops Tabasco  
sauce

Mix ingredients in small glass jar, cover  
and chill. Shake thoroughly and serve at  
once.

#### Fruit Salad Dressing

1 can Eagle Brand sweetened condensed  
milk (25 cents)  
3 eggs  
Beat eggs, whites and yolks together  
until frothy, add half can of condensed  
milk and beat for a few minutes. Then  
add remaining milk and beat again. Add  
juice of 4 medium sized lemons and beat  
for 5 minutes. Serve over fruit salads.  
It is delicious.

#### Pineapple Dressing

1 c. pineapple juice  
1 egg yolk  
Beat egg yolk and mix with cornstarch.  
Add pineapple juice to egg mixture and  
cook in upper part of double boiler until  
thick and smooth, stirring constantly. 1  
T. lemon juice may be added if desired.  
Add the butter just before removing from  
the fire. Serve over pineapple and cot-  
tage cheese salad or other fruit salad.  
Whipped cream may be added before  
serving.

#### Orange Dressing

1/4 c. orange juice  
1/4 T. lemon juice  
1 egg  
Mix fruit juices, add egg slightly beat-  
en, and sugar. Cook in upper part of  
double boiler until thick, stirring con-  
stantly. Cool and when cold fold in cream  
beaten stiff, then add salt. Serve with  
any combination of fruit arranged on  
lettuce leaves.

#### Mayonnaise Dressing

1 egg  
1 t. salt  
1/4 t. white pepper  
Beat egg, white and yolk together, un-  
til frothy, and begin adding oil, drop by  
drop, beating continually. The amount  
of oil added at a time may be gradually  
increased as the dressing begins to thicken.  
Continue adding oil until very thick  
and heavy, then add 1 t. salt and the

# UNION CARBIDE

In mansion  
farmhouse  
or cottage



The first house to be  
lighted by Carbide-gas,  
thirty years ago, and still  
lighted by this means.

THIS BEAUTIFUL HOME at Greenwich,  
Connecticut, was the first house to be  
lighted by Carbide-gas; and now, after  
thirty years, Carbide-gas still lights this  
mansion.

There are many homes throughout  
the country, the owners of which could  
afford, and could get any kind of light-  
ing they might wish—yet they prefer  
Carbide-gas because of the superiority  
of its light.

"Artificial sunlight" is the name  
frequently given to Carbide-gas light  
because scientific analysis proves that  
it has more of the color ingredients  
and quality of actual daylight than any  
other artificial illuminant.

Yet, in spite of its superiority, a  
Carbide-gas plant is well within the  
means of any farm owner. This is made  
plain by the fact that during the past  
twenty-five years 409,000 of these  
plants have been installed on farms all  
over the country.

The modern farmer realizes that to  
be efficient and to make the greatest  
income, he must have modern equip-  
ment. He buys farm machinery because  
he knows it will save money in the end.

And he buys a Carbide-gas plant for  
his home and farm buildings because  
good light saves much time in early  
morning and late evening work, as well  
as reducing household tasks by making  
it unnecessary to clean and fill lamps.

The modern farmer's wife also makes  
her duties easier and more pleasant by  
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pepper and thin to the right consistency  
with lemon juice. This recipe makes an  
unusually good dressing—it has a "zest"  
usually lacking in mayonnaise.

#### Horseradish Mayonnaise

Use equal proportions of grated horse-  
radish and mayonnaise, mix and serve  
over any desired salad greens. It is es-  
pecially good on asparagus salad.

#### Tartare Sauce

To 1 c. mayonnaise dressing add 1/4 T.  
each of finely chopped caper pickles,  
olives, parsley, and 1/2 shallot, finely  
chopped. This is especially good with  
fish.

#### Russian Dressing

1/4 c. mayonnaise 1 T. pimento,  
1/4 c. chili sauce chopped  
1 T. chopped celery 1 T. green pepper,  
cut in small pieces  
Mix ingredients and chill. Serve over  
sections of lettuce hearts, or other salad  
greens.

#### Thousand Island Dressing

To Russian dressing, given above, add  
just before serving, 1/4 c. cream beaten  
until stiff. Serve as in Russian dressing.

#### Sour Cream Dressing

1 c. sour cream 2 t. salt  
1 egg 2 t. sugar  
1/4 c. vinegar 1 t. mustard  
1/2 t. pepper

To the cream add egg, slightly beaten,  
vinegar and remaining ingredients, thor-  
oughly mixed. Cook in upper part of dou-  
ble boiler, stirring constantly until mix-  
ture thickens. Serve over lettuce, cu-  
cumbers, or tomatoes, or a combination  
of them.

#### Table of Abbreviations

1 t. equals 1 teaspoonful.  
1 T. equals 1 tablespoonful.  
1 c. equals 1 cupful.  
1 pt. equals 1 pint (2 cups).  
1 doz. equals 1 dozen (12).  
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No. 1943—Two Material Morning Dress.  
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No. 2403—Becoming Lines That Conceal Overweight.  
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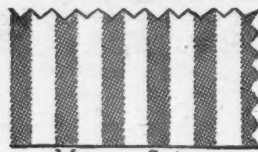
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Name.....Address.....

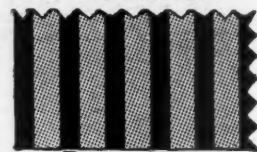
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# BETTER HOME DEPARTMENT

By E. W. Lehmann

## Safe Disposal of Human Wastes

THE SAFE disposal of human wastes is a problem on every farm. Health statistics reveal that there is a direct relation between the number of cases of typhoid fever, dysentery, summer complaint and hook-worm and the method used for the disposal of the human excreta. These diseases are recognized as filth diseases and can be practically eliminated by adopting proper sanitary measures. The problem is even more acute in the rural village or small town, where there are no sewers, than it is out in the open country.

The problem of sewage disposal for the rural home may be divided into two types, where there is no plumbing, and where there is water under pressure and a complete system of plumbing. Only a small per cent of the farm homes have modern plumbing, and the majority of the outdoor toilets are inadequate. They offer neither privacy nor protection, the two requirements of such a unit.

To give proper protection, such a building should be tightly constructed, ventilated, screened against flies, easily cleaned, and sanitary. To give privacy, both its location and design should be considered.

### Chemical Closets

There are many chemical closets on the market. Nearly all of them are of the same general type. The principle on which the closets work is the disinfection of all the material by means of a compound furnished by the company manufacturing the toilet. These systems vary all the way from the simple inexpensive bucket containers with seat (which would be a desirable device in a rural home without plumbing where there are old people and small children), to the more elaborate device, which in appearance is much like a standard sanitary fixture, connected with an underground tank. The cost of such equipment is almost as great as a standard sanitary toilet with water under pressure, and by comparison it is a mere makeshift.

### Disposal by Dilution

With an adequate water supply and plumbing, the water carriage system of sewage disposal as used in cities may be used and the final method of disposal can be made safe and sanitary without creating a nuisance. The sanitary sewer is a vital part of the plumbing system, and is all that is needed as far as disposal equipment is concerned when the isolated dwelling is located near a large body or large stream of water, for it may be extended out into the water beyond the low water line and there discharged. It is necessary in every case that disposal of sewage wastes by this means meet the requirements of the law in not creating a nuisance. In many states a special permit must be secured from the state health department for disposal of sewage by this method.

### Leaching Cesspool

The leaching cesspool has been and is still used in many localities, both on the farm and in the small village. Such a method of disposal is unsanitary and is unsafe unless located at a remote point where there is no danger of contamination of a water supply. In many towns the use of the leaching cesspool, due to its dangers, is prohibited by law.

### The Septic Tank

The septic tank is no doubt the safe

est and most satisfactory means of final disposal of sewage from the water carriage system. For proper operation, an adequate water supply is essential, and the septic tank should be considered as an essential part of a plumbing system in the country. Usually where there is only a kitchen sink installed, little difficulty is experienced in the disposal of wastes from the sink, but when a more complete system is installed, with bath room equipment, including a sanitary toilet, the system of disposal is liable to cause trouble. It is certainly a dangerous practice to discharge sewage directly on the surface of the ground without some treatment. When this is done there is always possibility of spread of disease.

### Function of Septic Tank

The function of the septic tank is to digest and liquefy the solids in the sewage and put it in condition so it may be finally disposed of without creating a nuisance. A septic tank does not completely purify sewage as is sometimes claimed; it merely completes one step in the process of purification. On the farm, a high degree of purification ordinarily is not necessary, because the discharge from the tank can usually be handled without further trouble. In city plants, filters and other devices must be resorted to for more complete purification.

### Type of Septic Tank

There are many types and sizes of septic tanks in use. Many of the tanks on the market are too small to give satisfactory service. A simple rectangular tank is a type that has given good results generally. Such tanks have been made in single and multiple chambers. The results of experimental work at the University of Illinois indicate that the two-chamber tank is more efficient than either the single-chamber or three-chamber tank. An important factor is to provide baffle boards or other means of preventing undue agitation of the contents of the tank and to prevent the scum and solid materials from passing out of the tank. A blueprint plan of a septic tank with table indicating the proper dimensions for different-sized families may be secured from the Farm Mechanics Department of the University of Illinois, Urbana, Ill., at a cost of 10 cents.

### Disposal of Effluent

Since the liquid discharge, or effluent, from a septic tank is not completely purified, proper precaution must be taken as to its final disposal. The method to select for final disposal is dependent on local conditions. The sub-surface irrigating tile provide the simplest and probably most effective means for average conditions. It is nothing more than ordinary drain tile, laid 12 to 16 inches underneath the surface of the ground and extending out from the septic tank on a slight downward grade. The length required depends upon the porosity of the soil and the quantity of the sewage. In ordinary soil, 30 to 40 feet of tile per person should be sufficient. More tile is required in tight clay and less in light loam or sandy soil. Ordinarily, sufficient length can be secured with one line of tile. When a greater length than 200 feet is required, or when space is limited, it is desirable to use more than one line of tile. This is accomplished by using a V-branch

(Concluded on page 38)



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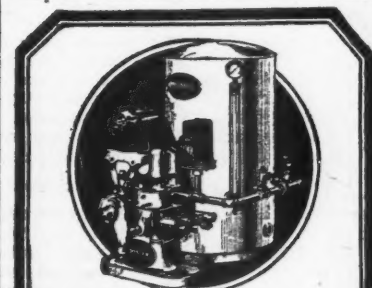
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Gentlemen:

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It may be of interest to you to know that I was a member of this same club up to about four years ago, when I resigned and joined the "Edgeworth Club." I don't mind telling you that I was employed in one of the largest tobacco companies in the country for about twelve years, and my loyalty to this company compelled me to smoke the brands of pipe tobacco which they manufactured; but try as I would, I could not become a steady pipe smoker. After I left this company several years ago, I tried Edgeworth Ready-Rubbed Tobacco, and I have been smoking it ever since.

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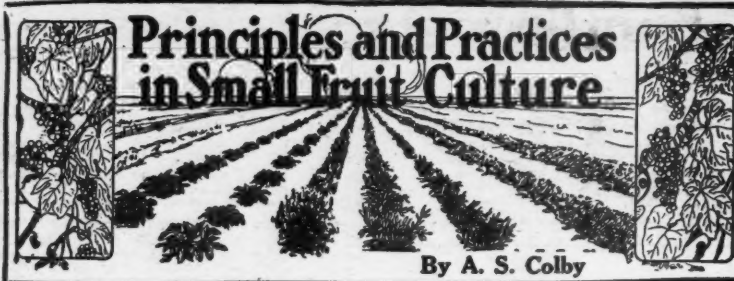
Let us send you samples of Edgeworth so that you may put it to the pipe test. If you like the samples, you'll like Edgeworth wherever and whenever you

buy it, for it never changes in quality. Write your name and address to Larus & Brother Company, 13E South 21st Street, Richmond, Va.

Edgeworth is sold in various sizes to suit the needs and means of all purchasers. Both Edgeworth Plug Slice and Edgeworth Ready-Rubbed are packed in small, pocket-size packages, in handsome humidor holders holding a pound, and also in several handy in-between sizes.

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By A. S. Colby

## Control of Important Small Fruit Insects

THE LIST of insects which attack small fruits is comparatively large. Some, like the currant worm, are quite common and serious if not controlled. Others, like the rose chafer, are chance feeders, occasionally infesting small fruits, such as the grape and blackberry, when especially abundant. Some means of protection must necessarily be provided against the destructive work of insects every year if small fruits are to be grown successfully.

### Classes of Insects from Standpoint of Control

Small fruit insects may be divided into two large classes, with a sub-class under each.

**Class I. Chewing Insects.**—These insects are provided with mouth parts which enable them to actually eat the fruit or foliage. The grape berry moth, the raspberry saw fly, and the strawberry leaf roller are typical examples. They are destroyed by poisoning their food. Lead arsenate is the standard material to use.

A sub-class under this large group includes those insects which feed almost entirely beneath the epidermis. This class includes the various borers of the raspberry and currant. Special preventative and sanitary measures are necessary in their control.

**Class II. Sucking Insects.**—Insects in this group obtain their food by pushing their mouth parts through the epidermis of the host plant and sucking up the plant juices from below. There are two principal classes, the protected and unprotected insects. This group includes the currant plant louse and the grape leaf hopper. The protected group includes the San Jose and other scales.

Since none of the sucking insects swallow their food, it is necessary to effect their control through the use of so-called contact poisons. These either suffocate the insects by stopping up their breathing pores or asphyxiate them by their toxic action. The protected insects are killed by the use of an acid, corrosive spray, sufficiently strong to eat through the protective outer coating of the scale and kill the insect beneath it. Various preparations containing nicotine are on the market for the control of the unprotected group, while lime sulphur, oil emulsion, and miscible oils are used against the protected or scale insects.

### Spraying as a Means of Insect Control

The majority of the important small fruit insects are effectively controlled by spraying. Some of the most noticeable exceptions include the cane-maggot, the cane-borer, and the tree cricket on the brambles, and the phylloxera on the grape. Methods of control for these insects will be discussed later on in this article. In working out a spray program for checking insect enemies, one should be familiar with the type of insect, whether chewing or sucking, its life history, and its most vulnerable stage. The poison most suitable for killing the insect can then be made up according to its proper strength and applied at the correct time.

### Spraying for Currant and Gooseberry Insects

**San Jose Scale.**—A serious pest, especially on currants. If unchecked it will very soon kill the plants. Spray the bushes before growth starts in

spring with a so-called dormant spray. Each 50 gallons of dormant spray should contain:

1½ gallons lubricating oil emulsion, or 5½ gallons commercial concentrated lime sulphur testing 33 degrees Baume, or 15 to 28 pounds of dry lime sulphur, or commercial miscible oils at the concentrations recommended by the manufacturers.

**Currant Worm.**—The most common insect on both currants and gooseberries. It is usually present each season. The bushes are often almost defoliated before the insect is noticed. The eggs are laid on the under side of the lower leaves soon after the leaves open in spring. A second brood appears about the time the currants are ripening. If treatment is applied in time, control is easy. Apply a spray of powdered arsenate of lead, one pound to 50 gallons of water, just before the blossoms appear. Be careful to cover the lower leaves. This amount is at the rate of three teaspoonfuls of the powder to one gallon of water. For the control of the second brood, fresh hellebore powder should be dusted on the bushes or used at the rate of one ounce to one gallon of water. It is not safe to use arsenicals on fruit at this time.

**Currant Aphid.**—Green plant lice or aphids often attack the under surface of leaves of currants and sometimes gooseberries, causing them to curl downwards. The upper surfaces are often elevated in large blisters and reddish in color. A contact poison, such as nicotine sulphate, is recommended. This is used at the rate of one fluid ounce to eight gallons of water, in which four ounces of laundry soap have been dissolved. It is necessary to cover the under sides of the leaves, since each insect must be hit with the spray if it is to be killed. Two sprays, the first just as the leaves are opening and the second just before the blossoms open, will usually control the aphids.

### Spraying for Raspberry and Blackberry Insects

**Rose Scale.**—Occasionally found on the blackberry, this insect is combated in the same manner as San Jose scale.

**Raspberry Saw Fly.**—This insect is usually found on the raspberry, but it sometimes attacks the blackberry. The damage is done by the immature larvae as they eat away most of the leaf tissue, leaving only the main ribs of the leaf. Spraying with arsenate of lead in the early stages of their development is effective. It is safest to spray the leaves thoroughly within 10 days after the plants are in full foliage.

**Red Spider.**—Strictly speaking, these are not insects but very small mites. Occasionally, in very hot dry weather they become prevalent on a number of plants, including the raspberry. They suck the plant juices from the under side of the leaf. A contact spray of nicotine sulphate, as described under the control measures for currant aphids, is fairly effective.

### Spraying for Strawberry Insects

The most common insect on strawberries, which can be controlled by spraying, is probably the leaf roller. The larval form is a very active worm. The damage is caused through the ac-

(Continued on page 37)



## Unbeatable for Orchard Work

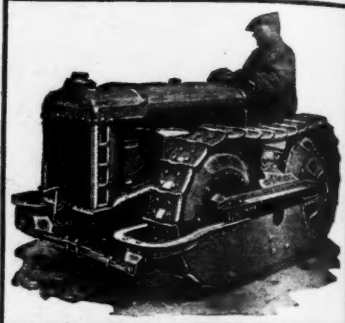
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for May, 1925

# Bee Keeping for Fruit Growers

By H. F. Wilson

## Extra Hive Bodies for Brood Rearing

THE TERM, "supering," applies to the addition of extra hive bodies for gathering the surplus crop of comb and extracted honey. Many beekeepers do not get the full significance of this term. It is very easy to think of supering in terms of adding extra supers at the will of the beekeeper. As a matter of fact, there is considerable science in providing supers at just the right time and in the arrangement of these supers in order to make the most of them.

Supering for surplus honey should not be confused with the adding of extra hive bodies for brood rearing in the spring. However, the beekeeper should begin to think of extra hive bodies as early as the first of May. These extra bodies at that time, however, should be considered from the standpoint of room for brood-rearing and swarm prevention, rather than for surplus honey. There can be no definite rule for adding extra hive bodies either during the brood-rearing period or during the period of the honey flow. Each beekeeper must learn for himself, through experience, the proper methods to follow.

In general, we must watch each colony and add the extra hive bodies in the spring as the bees seem to become crowded and need them. It is very easy to demoralize a weak colony by providing too much room. Providing extra hive bodies before colonies are ready for them, may have the opposite effect from that which the beekeeper desires and expects. If the colony is quite small, instead of the bees spreading out and moving into the extra supers, the extra room may have the effect of contracting the brood nest in the single hive body and the bees, becoming crowded in that chamber, may swarm in spite of extra room.

Do not add supers to any colony until that colony is full of bees. Under normal conditions this will mean that such a colony will have six or more frames of brood and a surplus of bees. When this is the case, the beekeeper may expect the bees to readily move into a second section of the brood chamber and to begin work immediately. In supering for honey production, the best success cannot be secured by haphazard adding of supers.

It is now quite a common practice to add supers in what is known as the "Demare" plan of supering. This consists of dividing the two sections of brood chamber when reared in two hive bodies and placing one or two extracting supers in between, over a queen excluder. The second hive body, containing brood, is placed at the top.

For the inexperienced beekeeper, it is best to add only one hive body at first. As soon as the bees have begun to store honey in one extracting super, a second super may be added, leaving the first one next to the main brood chamber. As soon as the first one has a considerable amount of honey in it, which may be from a week to 10 days during a good honey flow, interchange the two extracting supers, putting the super last added next to the brood chamber. There should at all times be one empty super, but not more, on the colony, so that plenty of room for ripening honey will be available.

The general plan of arrangement should normally be, first, the main brood chamber, then the queen excluder, an empty, or partially filled super, and on top of that additional supers, either partly or completely

filled and sealed, the ones nearest completed being at the top. In cases where the Demare plan has been followed, the top super should always be that part of the second hive body containing brood. This should be removed after a period of 21 days and placed in the store house until fall.

## Bees Help Pollination

RECENTLY at a meeting, three remarks were made by as many different beekeepers which have a pertinent bearing on the relation of fruit growing to beekeeping.

The first of these remarks was as follows: A fruit grower, who was not a beekeeper, came to the meeting to learn about beekeeping, and remarked that, during the past two years, his fruit crop had not been nearly as good as in previous years, and he was positive that this was due to the fact that, up to two years ago there had been bees on the neighboring farm, while during the last two years there have been none within several miles of him. He is planning to start beekeeping this year, principally for the good of his orchard.

A second man, who is both a fruit grower and a beekeeper, was heard to say that several times in his experience when his orchard had borne only a small crop, his bees, some hundred colonies, had more than paid the expenses of running the place, and he felt that bees were a necessity to him, as they usually provided a sure income if his orchard failed to bear a full crop.

Another fruit grower, who runs a small greenhouse in connection with his place on the edge of town, stated that he kept bees mainly for the pollination of certain greenhouse plants.

It is becoming more and more apparent that beekeeping and horticulture are so closely related that every fruit grower should know the principles of beekeeping and have at least a few stands of bees.

## Honey and Health

A RECENT article from a Swiss bee magazine presents some very interesting data regarding the feeding of honey to poorly nurtured children. According to this article, some very remarkable results have been secured in increasing the weight of these children by feeding them honey, especially in combination with a milk diet.

American people are not nearly so familiar with the food value of honey as are our European friends, who have been using honey as a daily part of their diet for centuries. However, the use of honey is becoming much more common in America, and will undoubtedly in time be a regular diet with all classes of people.

## Control of Important Small Fruit Insects

(Continued from page 36)

tion of the larva in rolling up the leaf, pulling it together at the edges and hiding inside its protective folds. The leaf soon dries up and dies.

In sections where the leaf roller is destructive, the application of lead arsenate (one and one-half pounds of powder or three pounds of paste in 50 gallons of spray) at the first appearance of the worms in spring is effective. Spraying should be done before the worm has protected itself by folding up the leaf. A pressure of at least 100 pounds helps materially to drive

## Classified Advertisements

### ADVERTISING RATES

15c a word. Count each initial, abbreviation, number or group of figures as one word. Thus "J. B. Jones, 44 E. Main St., Mount Morris, N. Y." counts as eleven words. Write advertisement on separate sheet. No display type or illustrations permissible. Because of the low rate, cash must accompany any order. For advertisements addressed in care of the American Fruit Grower Magazine allow 5 words for address. All replies forwarded as received. SPECIAL NOTICE—All advertising copy, discontinuance orders or change of copy intended for the Classified Department must reach this office by the 10th of this month for next issue. Address: American Fruit Grower Magazine, 53 W. Jackson Blvd., Chicago.

### FARMS AND ORCHARDS

VIRGINIA—MONTROSE ORCHARD PRODUCE bumper crop, 3700 trees, 1924 crop, 8400 barrels, is considered an excellent yield. Trees from 12 to 14 years old, mostly 40 ft. planting, 1927 30 acres, ample buildings, price \$50,000. This 30 acre wanting the biggest bargain in Virginia. On terms given the net profits will pay for the property. Write for full details. Venable & Ford, Lynchburg, Va.

FOR SALE—900 ACRES, BORDERING LAKE, farm buildings, 65 acres tillage, 1000 apple trees, natural apple land. Would make good sheep farm. Many acres of white pine and hard wood growth. Located near state road and railroad. E. L. Sewell, East Lebanon, Maine.

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FOR SALE—ELEVEN ACRE CHERRY ORCHARD, 4 to 7 years old. Perfect condition. Easy terms. C. R. Crisman, Warrensburg, Mo.

FOR SALE—25 ACRES BEST VARIETIES APPLS, bearing; tillable, 100 acres; good water. Elev., 5000 feet. Box 207, Banning, Calif.

### PLANTS—SEEDS

NORTHERN GROWN STRAWBERRY PLANTS—Dunlap, \$3.00 1000; Gibson, Glen Mary, Aroma, \$4.50; Premier Delicious, Marvel, World's Wonder, \$4.00; Big Joe Crampton, \$7.00; New Cooper, \$9.00; New Champion Everbearing, \$9.00; Concord Grapes, \$18.00. 100 Champion Everbearing, \$1.50, postpaid. Following \$1.00 each, any 6 \$5.00; 125 Strawberry; 25 Raspberry; 12 Concord Grapes; 5 Currants; 15 Asparagus; 12 Rhubarb; 36 Gladioli; 3 Peonies; 4 Roses; 8 Iris; 4 Bridal Wreath; 6 Assorted Ornamental Shrubs. Catalog. O. Kiger Nursery, Sawyer, Mich.

GRAPE CUTTINGS—THRIFTY CONCORDS, \$5.00 per thousand. Directions for growing furnished each order. Champion Everbearing Strawberry, guaranteed true, \$7.50 per thousand. Grimes Golden, two-year old apple trees, 10c to 35c. E. V. Wright, Hamburg, Iowa.

\$1.00 COLLECTIONS, YOUR CHOICE OF 12 Dahlias, 10 Cannas, 15 Gladioli or 12 Iris. McMullen Nursery, Box 447, Council Bluffs, Iowa.

EVERBEARING STRAWBERRY PLANTS (PROGRESSIVE, Champion.) State inspected, \$2.00 hundred postpaid. Stevens Nurseries, Deerfield, N. H.

MILLIONS FROSTPROOF CABBAGE AND TOMATO PLANTS, 1000, \$2.00; 500, \$1.25, postpaid. Special prices in large lots. East Va. Plant Farm, Franklin, Va.

### DOGS

FOXTERRIERS, BEST VARMIT, WATCHDOG, companion. All studs champions. \$10 up. Well's Kennels, Farina, Illinois.

### HELP WANTED

U. S. GOVERNMENT JOBS, \$95 TO \$250 month. Men-women, 18 up. All postal salaries just raised. Steady work, life positions, short hours, vacation. Common education sufficient. Sample coaching and full particulars free. Write today sure. Franklin Institute, Dept. D-94, Rochester, N. Y.

ALL MEN, WOMEN, BOYS, GIRLS, 17 TO 65, willing to accept Government Positions, \$117-\$300, traveling or stationary, write Mr. Osmont, 250, St. Louis, Mo., immediately.

### TOBACCO

HOMESPUN TOBACCO—CHEWING—FIVE pounds, \$1.50; ten, \$2.50. Smoking: Five pounds, \$1.25; ten, \$2.00. Pipe free. Pay when received. Satisfaction guaranteed. Kentucky Farmers Association, Paducah, Ky.

the solution into the folds where insects may have begun their attack.

### Spraying for Grape Insects

Grapes must be carefully and consistently sprayed if they are to be a profitable crop. Two of the most important insect pests occasionally found are the San Jose scale and the grape flea beetle. The former is controlled by a dormant spray as recommended for use on currants. The grape flea beetle, a handsome blue insect about one-fifth of an inch long, appears just as the buds are opening and eats out the centers of the buds. The buds must be protected with a strong solution of lead arsenate, using two pounds of the powder in 50 gallons of spray.

Grape Berry Moth.—This insect is found quite generally throughout the most important commercial grape growing sections of the eastern United States, excepting perhaps in Michigan. The first generation often infests the young grape clusters before the blossoms open. Other generations work in the fruit, effectively spoiling it for any future use.

Arsenate of lead, one pound of powder in 50 gallons of solution, should be used in the control of grape berry

### AGENTS WANTED

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AGENTS, \$15 DAILY SELLING "SWINGUP." Great accident preventer, necessity for auto drivers. Agent writes "Sell better than hot cakes." 200% profit. Industrial Development Corp., Dept. 3, Bridgeport, Conn.

BIG MONEY AND FAST SALES. EVERY owner buys gold initials for his auto. You charge \$1.50; make \$1.35. Ten orders daily easy. Write for particulars and free samples. American Monogram Co., Dept. 92, East Orange, N. J.

\$20 PROFIT DAILY SELLING SELF-THREADING needles, needlebooks. Cost 3c-5c, sell 25c. Three samples, 25c. Catalogue free. Needlebook Specialty Co., Dept. 17, 981 Broadway, New York.

AGENTS—WRITE FOR FREE SAMPLES. SELL Madison "Better-Made" Shirts for large manufacturer direct to wearer. No capital or experience required. Many earn \$100 weekly and bonus. Madison Corporation, 555 Broadway, New York.

CAN YOU SELL FORD SIZE TIRES AT \$3.50 each? Write for plan. Details free. American Accessories Co., Dept. 103, Cincinnati, Ohio.

### PATENTS AND TRADE-MARKS

"PATENT PARTICULARS" AND ADVICE ON trade-marks, free. Write. Sterling Buck, W-629 F, Washington, D. C.

INVENTIONS COMMERCIALIZED. WHAT HAVE you? Adam Fisher Mfg. Co., 531 Enright, St. Louis, Mo.

### SORTING AND SIZING MACHINES

FREE BOOK ON SORTING AND SIZING APPLIES and peaches. Send for copy today. Cutler Manufacturing Co., East Tenth St., Portland, Ore.

### RADIO

2500 MILES DISTANCE WITH ONE TUBE. WE send complete understandable instructions with panel layout, picture diagrams, etc., for 25c or big booklet free. Vesco Radio Co., Box 117-AFG, Oakland, California.

### MISCELLANEOUS

CLOSING OUT OUR STOCK OF SAUER SHOT Guns. Send for special price list. Baker & Kimball, 36 South St., Boston, Mass.

HATCHING EGGS, CHICKS, DUCKLINGS, ALL varieties. Associated Poultry Farms, Hudson, Ill.

### HELP WANTED—FEMALE

WANTED—GIRLS—WOMEN. LEARN GOWN making at home. Earn \$25.00 week. Learn while earning. Sample lessons free. Write immediately—today. Franklin Institute, Dept. D-547, Rochester, N. Y.

### CHICKS

GIANT WHITE ROCKS, HALBACK STRAIN, large, big boned, heavyweight birds. Real egg machines with size and quality. Setting, \$1.50; 100, \$7.00; case, \$21.00; 100 chicks, \$22.00; 500, \$85.00. Ella Whitwood, Hudson, Illinois.

### FOR SALE

FOR SALE—1 No. 12 M. GILEAD CIDER Press, 1 No. 3-A Farquhar Press. Each used only one season. Thomas & Company, Frederick, Md.

moth, as follows: The first application should be made just before the bloom appears, the second immediately after the fall of the bloom, and the third 10 days after the fall of the bloom.

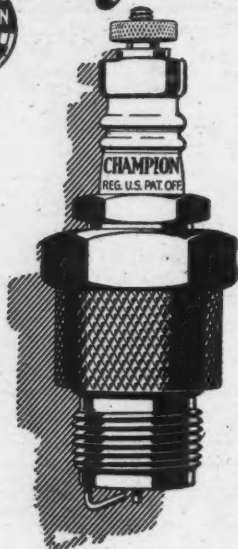
Grape Root Worm.—This insect is quite generally prevalent in the eastern and northern grape growing sections.

The damage done is mostly underground and, therefore, seldom noticed until it has caused considerable injury. The larvae work on the roots, eating the small roots and burrowing into the larger ones. The adult form of the insect, a small brown beetle, appears at about the close of the blossoming period and feeds upon the leaf surface. Eggs are laid on the canes and the larvae soon hatch, working down to the roots. The beetles can be fairly well controlled by applications of lead arsenate, one and one-half pounds of powder in 50 gallons of solution. This should be applied just before and just after the bloom.

Grape Leaf Hopper.—The leaf hopper is found throughout this country and Canada where the grape is grown. The leaves are attacked by the insects which congregate on the lower leaf



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surfaces, sucking the plant juices. This attack results in premature defoliation, saps the vitality of the plant, and reduces the size and quality of the fruit.

Where the leaf hopper is serious, careful watch should be kept as to its development. When the first hatched insects are almost ready to develop wings, or even when but a few individuals are seen to have reached that winged stage, it is time to spray. Apply nicotine sulphate, one-half pint to 50 gallons of solution. Every insect must be hit if the spray is to be effective. The undersides of the leaves should be thoroughly covered.

#### Insects Not Controlled by Spraying

**Curraut Borer.**—This insect is serious especially on black currants and on red varieties in patches of declining vigor. Gooseberries are sometimes attacked. The larvae eat a furrow along the center of the cane, remaining in the tunnel over winter. Affected canes may leaf out with sickly-looking foliage the following spring, but they soon die. The only practicable method of control is by cutting out and burning infested canes as soon as noticed. Currants should be grown in bush form only. Systematic pruning should be an annual practice.

**Raspberry Cane Borer.**—This insect is probably the worst pest of raspberries which is not controlled by spraying. The female is one of the long-horned borers which deposit their eggs in the pith of the young growing cane. She makes at the same time two rows of punctures around the cane on either side of the spot where she has placed the egg. This injury causes a wilting of the canes, and the observant grower knows that something is wrong. The larvae live in the cane for two years before emerging to complete their life cycle. The wilting of the tips should be warning enough to cut and burn infested canes at once. This will destroy most of the larvae.

**Raspberry Cane Maggot.**—The damage is caused by the work of a small footless maggot, white in color, the larva of a true fly. It burrows in the tip of the young cane in early spring, girdling the cane just inside the bark. The girdled portion wilts, turns dark blue in color, and dies. The larva continues its path down through the cane. It transforms to a pupa and remains until spring, when it emerges as the adult fly. Gather and burn the canes as soon as the wilting tips are noticed.

**White Grub.**—The "June bug" is often destructive to strawberry plants in its larval stage. If the patch has been just previously in sod, this grub may be found in the soil. It attacks the roots and crowns of the plants. The remedy is to avoid such soil by choosing a site one year previous to the time of planting it to strawberries and growing a cultivated crop on the land that season, thus killing most of the grubs.

**Grape Phylloxera.**—This is one of the most destructive forms of plant lice. It is especially serious on the roots of European grapes. The native grapes are sometimes attacked but are more resistant because of their thicker, tougher root structure. The lice attack the rootlets in great numbers, producing small nodules, which decay and injure the roots to such an extent that death of the vine often follows. The whole life cycle is complicated and there are variations from year to year. Occasionally there is a leaf-infesting form. The use of resistant varieties, or at least the use of roots of resistant types, is the only satisfactory means of control.

#### Supplementary Aids in Insect Control

Sanitation in the small fruit plantation and vineyard plays a highly important part in holding insects in check. Keep weeds and grass down near the vineyard if easier control of leaf hopper is desired. The mature form hibernates in such shelters. Burn over the strawberry patch immediately after fruiting and follow that by renovation. Many leaf rollers will be killed in this way.

## Profitable Poultry



By H. A. Bittenbender

## Making Hens Pay for Their Feed

**MANY** flocks this summer will not pay for the feed consumed. There may be many reasons why this is true. In some cases it is a question of the quality of the hens themselves, while in many cases it is the feed that is given rather than the hens.

We might say that there are two factors in making the hens pay, one the owner and the other the hen. Under no consideration does it pay to restrict the feed. It is a physical impossibility for hens to lay unless they have sufficient food of the proper kind. The worst thing that can be done is to limit the mash. The drop in egg production may not be noticed for a week or two because the hens are using stored up energy, but the hen cannot continue to use reserve material for any period of time. It takes

#### What to Feed

A well-balanced ration contains some grain, mash, green food, oyster shell, and animal protein or milk. If commercial mash is used, be sure that the mash does not carry an excess of crude fiber and that it has a sufficient amount of animal protein to assure good egg production. If a home-made mash is used, the same factors should be kept in mind. The following mash has given good results:

- 100 pounds ground corn.
- 100 pounds ground oats.
- 100 pounds flour middlings.
- 100 pounds bran.
- 100 pounds gluten.
- 50 pounds high protein meat scrap.

If liquid buttermilk or skim milk is not available, paste milk may be fed at the rate of one pound to 50 birds, or 40 pounds of dried buttermilk may be added to the above mixture. This mash is best fed by means of an open self-feeding hopper, which is available to the birds at all times.

The scratch grain should be limited and only a small amount given in the morning, if at all. The main feeding should be at night if the birds have free range where they can pick up considerable of their living. However, if the birds are yarded in bare yards, one-third of the daily grain ration should be fed in the morning and two-thirds at night.

#### Eliminate the Unprofitable Birds

At this season of the year some hens will be slowing up in their production while others continue to lay a sufficient number of eggs to be profitable. Why not eliminate the slacker? Keep only those hens that are utilizing their feed to advantage.

#### What to Eliminate

When a hen quits laying at this season of the year, it is the best plan to put this hen on the market. In most cases she will be of good flesh and weight. If, however, she quits laying because of thin flesh, low vitality or evidences of disease, she should not be put on the market but should be killed and burned.

The following description will give an idea of how to distinguish between the hens that are laying and those that are not laying:

**Laying Hens**  
1. Have a bright red, fine textured, pliable comb.

2. Are wide between the points of the pubis bones. Bones are thin and pliable.

**Non-Layers**  
1. Have a dull colored or faded comb, sometimes covered with whitish scales.  
2. Are narrow between the points of the pubis bones. Bones are thick.

3. Are soft, loose and pliable in the abdominal region.  
4. Are energetic in search of food and consume large quantities if available.

5. Are first to leave the roost in the morning and last to go on at night.

6. Go to roost with full crops if it is possible to get the food.

3. May be tight and rubbery.

4. May be listless and lazy.

5. Are early to bed and late to rise.

6. Eat less than laying hens. Crop often only partly filled at night.

#### Broody Hens

Broody hens may not be culled but should be put into a special pen where they may be well fed and brought back into production. However, if broody hens are allowed to remain on the nests, it is only a short time until they lose weight, and it takes a good deal of feed and considerable time to bring them back into production.

#### Coarse Beefy Hens

It has been found that hens of the coarse, meaty type are low producers. Some hens, instead of turning feed into eggs, lay on fat. This can usually be determined if a close observation is made. Low producing hens of the meaty type usually have eyebrows that are thick and over-hanging. The eye is less prominent and sunken. There is considerable evidence of wrinkles and puffiness around the eyes. The head throughout presents a coarse meaty, thick appearance. This coarseness is carried throughout and is shown in the meatiness and thickness of the pelvic bones.

#### Cull Out Overfat Hens

Bagginess or overfat condition usually comes with low egg production. Oftentimes the broken-down overfat condition does not appear until the end of the first laying year. Even though the birds show that they have made a fairly good production the previous year, it is well to eliminate them from the flock because the second year's production will usually be low. Another reason for eliminating the overfat baggy hens is that they are apt to drop off during the summer months. The loss in these heavy hens can be eliminated by culling them out of the flock, either at the end of the first laying year or when they appear in the early summer at the end of their second laying year.

## Safe Disposal of Human Wastes

(Continued from page 35)

to construct a fork in the outlet line from the tank. The lines should be laid parallel to each other and about 10 feet apart. In either case, if the system originally constructed proves to be inadequate, it is a simple matter to extend it or to add another line when this becomes necessary. A better distribution of effluent over the course is obtained by laying the half of the line nearest the tank with a slope of one foot per 100 feet and the other half with a slope of six inches per 100 feet. Seepage and purification goes on best in the open soil near the surface; hence, lay the tile only at a sufficient depth to prevent freezing. By laying the tile near the surface of the soil, the waste seeps out between the tile joints, and the bacteria in the surface layer complete the job of final purification and disposal.



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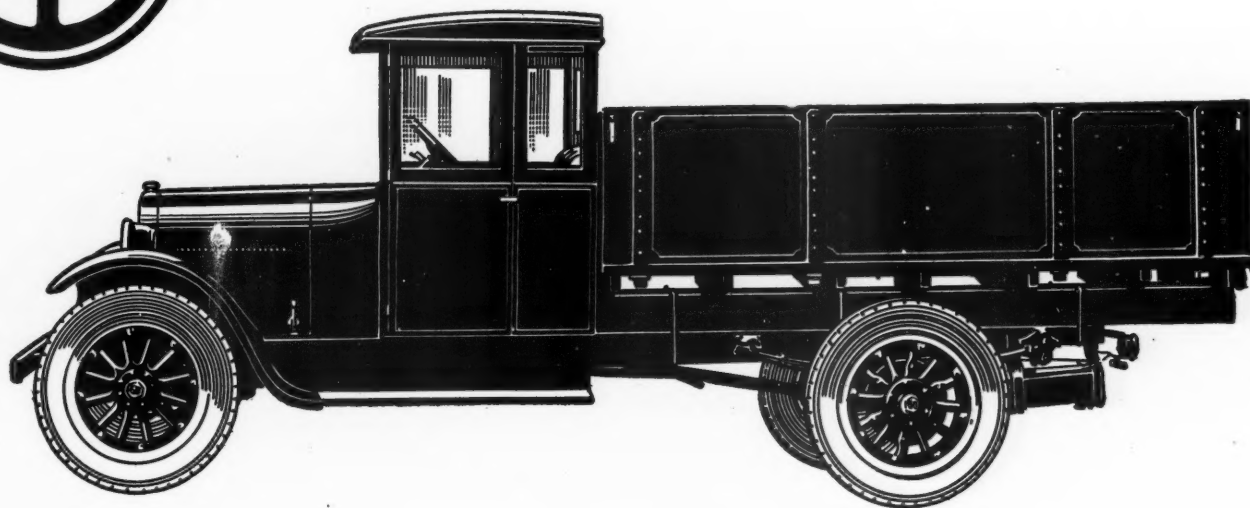
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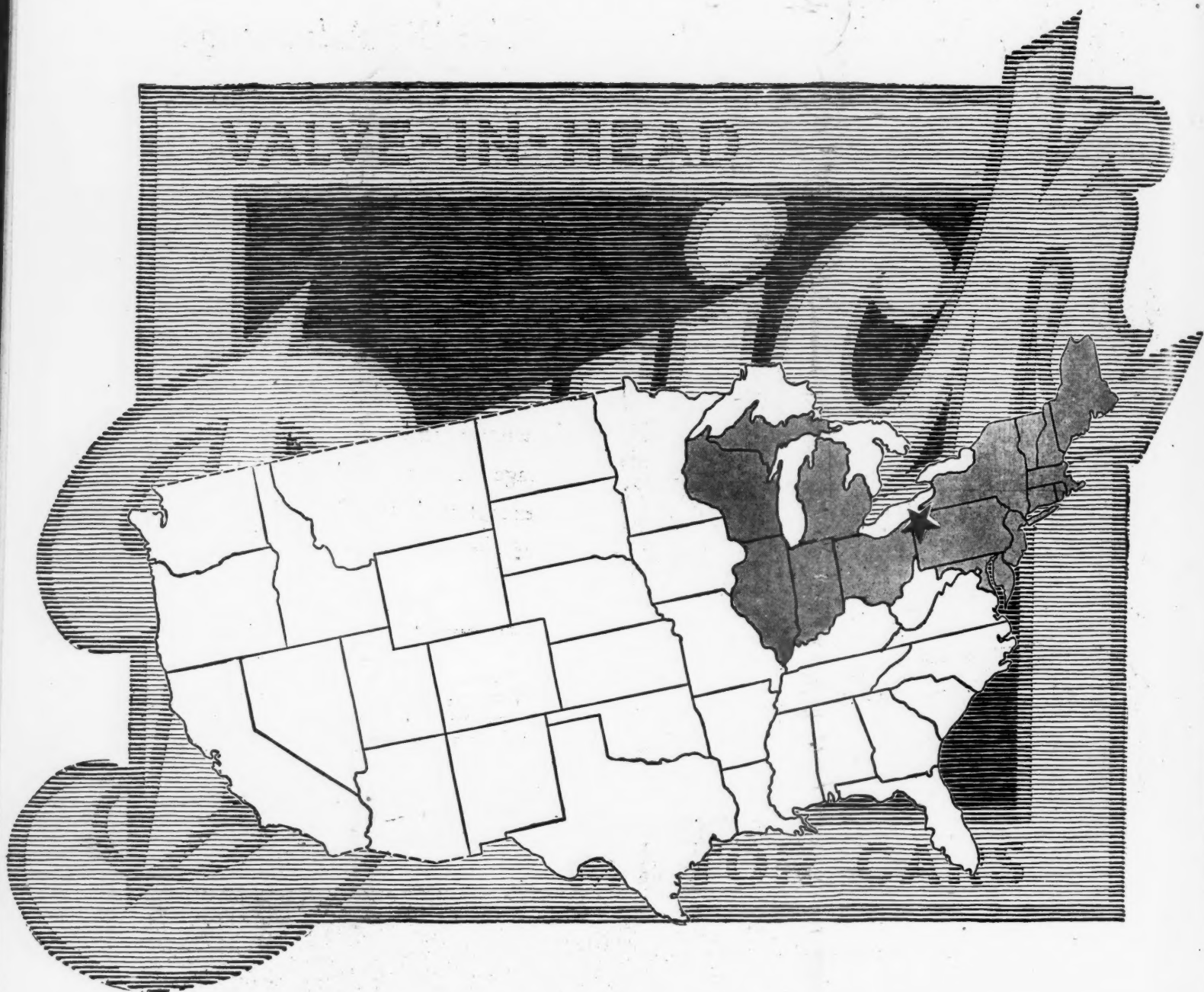
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